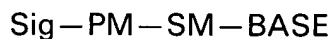


**KINDLY AMEND THE ABOVE-IDENTIFIED APPLICATION AS FOLLOWS:**

**In The Claims:** Please enter the complete listing of all claims listed below.

Claims 1-825 (Canceled)

826. (NEW) An oligo- or polydeoxyribonucleotide which is complementary to a nucleic acid of interest or a portion thereof, said oligo- or polydeoxyribonucleotide comprising at least one modified nucleotide or modified nucleotide analog having the formula



wherein PM is a phosphate moiety, SM is a furanosyl moiety and BASE is a base moiety or a base analog comprising a pyrimidine, a pyrimidine analog, a purine, a purine analog, a deazapurine or a deazapurine analog, wherein said analog can be attached to or coupled to or incorporated into DNA or RNA, wherein said analog does not substantially interfere with double helix formation or nucleic acid hybridization, wherein said PM is attached to SM, said BASE is attached to SM, said Sig is covalently attached to PM directly or through a chemical linkage, and wherein said Sig comprises a non-polypeptide, non-nucleotidyl, non-radioactive label moiety which can be directly or indirectly detected when attached to PM or when said modified nucleotide is incorporated into said oligo- or polydeoxyribonucleotide or when said oligo- or polydeoxyribonucleotide is hybridized to said complementary nucleic acid of interest or a portion thereof.

827. (NEW) The oligo- or polydeoxyribonucleotide of claim 826, wherein Sig comprises at least three carbon atoms.

**Enz-5(D6)(C2)**

828. (NEW) The oligo- or polydeoxyribonucleotide of claim 826, wherein Sig comprises biotin, iminobiotin, an electron dense component, a magnetic component, a metal-containing component, a fluorescent component, a chemiluminescent component, a chromogenic component, a saccharide component or a combination of any of the foregoing.

829. (NEW) The oligo- or polydeoxyribonucleotide of claim 828, wherein said magnetic component comprises magnetic oxide.

830. (NEW) The oligo- or polydeoxyribonucleotide of claim 829, wherein said magnetic oxide comprises ferric oxide.

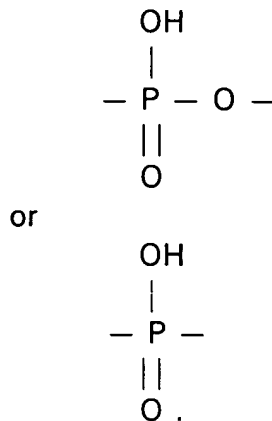
831. (NEW) The oligo- or polydeoxyribonucleotide of claim 828, wherein said metal-containing component is catalytic.

832. (NEW) The oligo- or polydeoxyribonucleotide of claim 828, wherein said fluorescent component comprises fluorescein, rhodamine or dansyl.

833. (NEW) The oligo- or polydeoxyribonucleotide of claim 828, wherein said saccharide component comprises a polysaccharide, an oligosaccharide or a monosaccharide.

834. (NEW) The oligo- or polydeoxynucleotide of claim 833, wherein said saccharide component comprises a monosaccharide.

835. (NEW) The oligo- or polydeoxyribonucleotide of claim 826, wherein said covalent attachment comprises

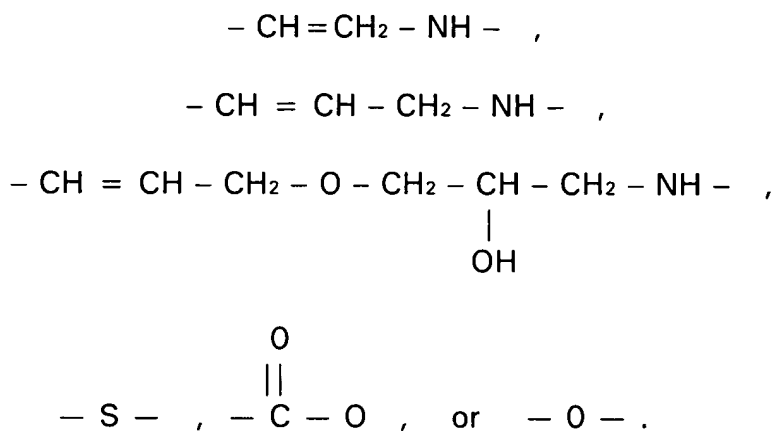


836. (NEW) The oligo- or polydeoxyribonucleotide of claim 826, wherein said chemical linkage does not interfere substantially with the characteristic ability of Sig to form a detectable signal.

837. (NEW) The oligo- or polydeoxyribonucleotide of claim 826, wherein said chemical linkage comprises a -CH<sub>2</sub>NH- moiety.

838. (NEW) The oligo- or polydeoxyribonucleotide of claim 826, wherein said chemical linkage comprises an allylamine group.

839. (NEW) The oligo- or polydeoxyribonucleotide of claim 826, wherein said chemical linkage comprises any of the moieties:



840. (NEW) The oligo- or polydeoxyribonucleotide of claim 826, wherein said chemical linkage comprises a glycosidic linkage moiety.

841. (NEW) The oligo- or polydeoxyribonucleotide of claim 826, wherein said PM comprises a monophosphate, a diphosphate or a triphosphate.

842. (NEW) The oligo- or polydeoxyribonucleotide of claim 826, wherein said Sig moiety is covalently attached to said PM through a phosphorus atom or phosphate oxygen.

843. (NEW) The oligo- or polydeoxyribonucleotide of claim 826, wherein said Sig moiety is attached to the furanosyl moiety of a terminal nucleotide in said oligo- or polydeoxyribonucleotide.

844. (NEW) The oligo- or polydeoxyribonucleotide of claim 843, wherein the furanosyl moiety of said terminal nucleotide comprises a hydrogen atom at the 2' position thereof.

845. (NEW) The oligo- or polydeoxyribonucleotide of claim 843, wherein the furanosyl moiety of said terminal nucleotide has an oxygen atom at the 2' position thereof.

846. (NEW) The oligo- or polydeoxyribonucleotide of claim 844, wherein the furanosyl moiety of said terminal nucleotide comprises a hydrogen atom at the 3' position thereof.

847. (NEW) The oligo- or polydeoxyribonucleotide of claim 845, wherein the furanosyl moiety of said terminal nucleotide comprises an oxygen atom at the 3' position thereof.

848. (NEW) The oligo- or polydeoxyribonucleotide of claim 834, wherein said monosaccharide is attached to a terminal nucleotide in said oligo- or polydeoxyribonucleotide.

849. (NEW) The oligo- or polydeoxyribonucleotide of claim 826, wherein said furanosyl moiety comprises a ribose, a deoxyribose or a dideoxyribose.

850. (NEW) The oligo- or polydeoxyribonucleotide of claim 826, wherein said pyrimidine analogs comprise thymidine analogs, uridine analogs, deoxyuridine analogs, cytidine analogs, deoxycytidine analogs or a combination of any of the foregoing.

851. (NEW) The oligo- or polydeoxyribonucleotide of claim 850, wherein said uridine analogs comprise 5-bromo-2'-deoxyuridine-5'-phosphate.

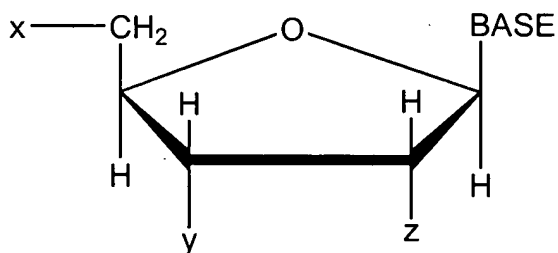
852. (NEW) The oligo- or polydeoxyribonucleotide of claim 850, wherein said deoxycytidine analogs comprise 5-hydroxymethyl-2'-deoxycytidylic acid.

853. (NEW) The oligo- or polydeoxyribonucleotide of claim 826, wherein said purine analogs comprise adenosine analogs, deoxyadenosine analogs, guanosine analogs, deoxyguanosine analogs or a combination of any of the foregoing.

854. (NEW) The oligo- or polydeoxyribonucleotide of claim 853, wherein said adenosine analogs comprise tubericidin or toyocamycin.

855. (NEW) The oligo- or polydeoxyribonucleotide of claim 826, further comprising at least one ribonucleotide.

856. (NEW) An oligo- or polydeoxyribonucleotide which is complementary to a nucleic acid of interest or a portion thereof, said oligo- or polydeoxyribonucleotide comprising at least one modified nucleotide or modified nucleotide analog having the structural formula:



wherein BASE is a moiety comprising a pyrimidine, a pyrimidine analog, a purine, a purine analog, a deazapurine or a deazapurine analog, wherein said analog can be attached to or coupled to or incorporated into DNA or RNA, wherein said analog does not substantially interfere with double helix formation or nucleic acid

hybridization, and wherein said BASE is attached to the 1' position of the furanosyl ring from the N1 position when said BASE is a pyrimidine or a pyrimidine analog, or from the N9 position of the furanosyl ring when said BASE is a purine, a purine analog, a deazapurine or a deazapurine analog;

wherein x comprises H—, HO—, a mono-phosphate, a di-phosphate or a tri-phosphate;

wherein y comprises H—, HO—, a mono-phosphate, a di-phosphate or a tri-phosphate;

wherein z comprises H—, HO—, a mono-phosphate, a di-phosphate or a tri-phosphate; and

wherein Sig is covalently attached directly or through a chemical linkage to at least one phosphate comprising x, y, z, or a combination thereof, and wherein said Sig comprises a non-polypeptide, non-nucleotidyl, non-radioactive label moiety which can be directly or indirectly detected when attached to said phosphate or when said modified nucleotide is incorporated into said oligo- or polydeoxyribonucleotide or when said oligo- or polydeoxyribonucleotide is hybridized to said complementary nucleic acid of interest or a portion thereof.

857. (NEW) The oligo- or polydeoxyribonucleotide of claim 856, wherein Sig comprises at least three carbon atoms.

858. (NEW) The oligo- or polydeoxyribonucleotide of claim 856, wherein Sig comprises biotin, iminobiotin, an electron dense component, a magnetic component, a metal-containing component, a fluorescent component, a chemiluminescent component, a chromogenic component, a saccharide component or a combination of any of the foregoing.

859. (NEW) The oligo- or polydeoxyribonucleotide of claim 858, wherein said magnetic component comprises magnetic oxide.

860. (NEW) The oligo- or polydeoxyribonucleotide of claim 859, wherein said magnetic oxide comprises ferric oxide.

861. (NEW) The oligo- or polydeoxyribonucleotide of claim 858, wherein said metal-containing component is catalytic.

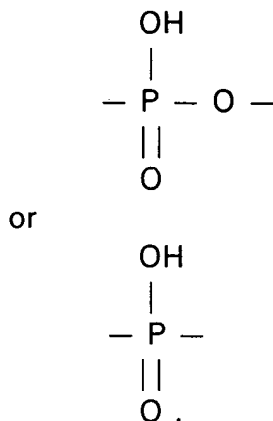
862. (NEW) The oligo- or polydeoxyribonucleotide of claim 858, wherein said fluorescent component comprises fluorescein, rhodamine or dansyl.

863. (NEW) The oligo- or polydeoxyribonucleotide of claim 858, wherein said saccharide component comprises a polysaccharide, an oligosaccharide or a monosaccharide.

864. (NEW) The oligo- or polydeoxynucleotide of claim 863, wherein said saccharide component comprises a monosaccharide.



865. (NEW) The oligo- or polydeoxyribonucleotide of claim 856, wherein said covalent attachment comprises

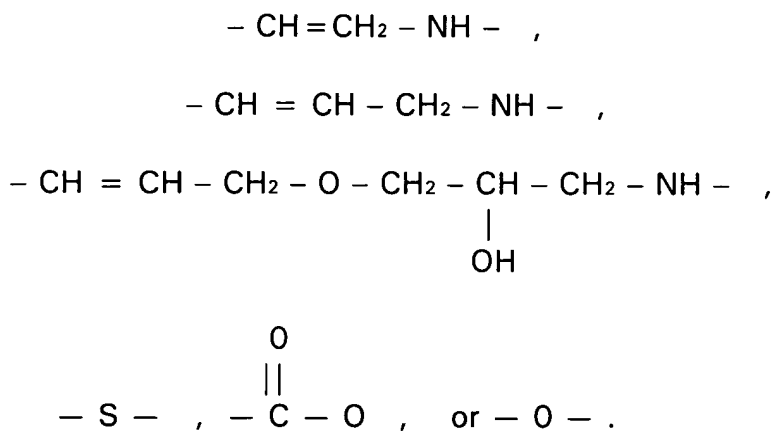


866. (NEW) The oligo- or polydeoxyribonucleotide of claim 856, wherein said chemical linkage does not interfere substantially with the characteristic ability of Sig to form a detectable signal.

867. (NEW) The oligo- or polydeoxyribonucleotide of claim 856, wherein said chemical linkage comprises a -CH<sub>2</sub>NH- moiety.

868. (NEW) The oligo- or polydeoxyribonucleotide of claim 856, wherein said chemical linkage comprises an allylamine group.

869. (NEW) The oligo- or polydeoxyribonucleotide of claim 856, wherein said chemical linkage comprises any of the moieties:



870. (NEW) The oligo- or polydeoxyribonucleotide of claim 856, wherein said chemical linkage comprises a glycosidic linkage moiety.

871. (NEW) The oligo- or polydeoxyribonucleotide of claim 856, wherein said x comprises a monophosphate, a diphosphate or a triphosphate and y comprises a monophosphate.

872. (NEW) The oligo- or polydeoxyribonucleotide of claim 856, wherein said Sig moiety is covalently attached to said phosphate through a phosphorus atom or phosphate oxygen.

873. (NEW) The oligo- or polydeoxyribonucleotide of claim 856, wherein said x comprises a monophosphate.

874. (NEW) The oligo- or polydeoxyribonucleotide of claim 856, wherein said Sig moiety is attached to the furanosyl moiety of a terminal nucleotide in said oligo- or polydeoxyribonucleotide.

875. (NEW) The oligo- or polydeoxyribonucleotide of claim 874, wherein z of said furanosyl moiety of said terminal nucleotide comprises a hydrogen atom.

876. (NEW) The oligo- or polydeoxyribonucleotide of claim 874, wherein z of said furanosyl moiety of said terminal nucleotide comprises an oxygen atom.

877. (NEW) The oligo- or polydeoxyribonucleotide of claim 875, wherein y of said furanosyl moiety comprises a hydrogen atom.

878. (NEW) The oligo- or polydeoxyribonucleotide of claim 876, wherein y of said furanosyl moiety comprises an oxygen atom.

879. (NEW) The oligo- or polydeoxyribonucleotide of claim 864, wherein said monosaccharide is attached to a terminal nucleotide in said oligo- or polydeoxyribonucleotide.

880. (NEW) The oligo- or polydeoxyribonucleotide of claim 856, wherein said furanosyl moiety comprises a ribose, a deoxyribose or a dideoxyribose.

881. (NEW) The oligo- or polydeoxyribonucleotide of claim 856, wherein said pyrimidine analogs comprise thymidine analogs, uridine analogs, deoxyuridine analogs, cytidine analogs, deoxycytidine analogs or a combination of any of the foregoing.

882. (NEW) The oligo- or polydeoxyribonucleotide of claim 881, wherein said uridine analogs comprise 5-bromo-2'-deoxyuridine-5'-phosphate.

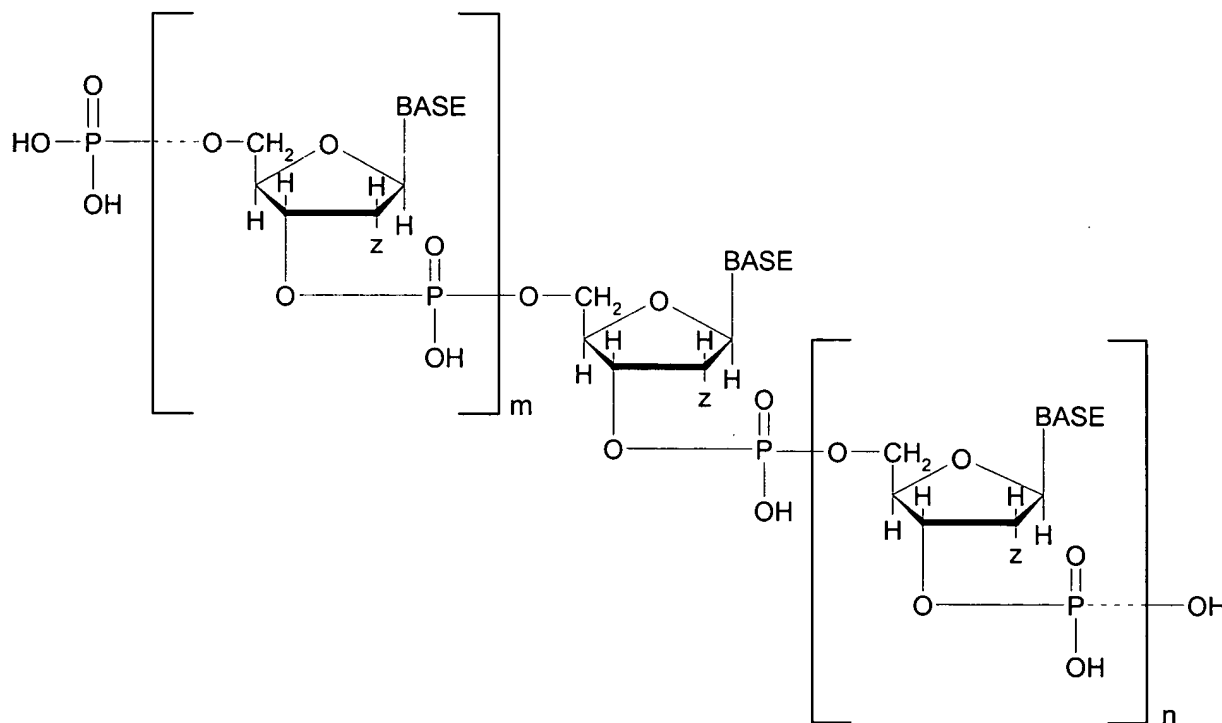
883. (NEW) The oligo- or polydeoxyribonucleotide of claim 881, wherein said deoxycytidine analogs comprise 5-hydroxymethyl-2'-deoxycytidylic acid.

884. (NEW) The oligo- or polydeoxyribonucleotide of claim 856, wherein said purine analogs comprise adenosine analogs, deoxyadenosine analogs, guanosine analogs, deoxyguanosine analogs, or a combination of any of the foregoing.

885. (NEW) The oligo- or polydeoxyribonucleotide of claim 884, wherein said adenosine analogs comprise tubercidin or toyocamycin.

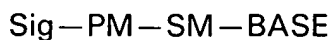
886. (NEW) The oligo- or polydeoxyribonucleotide of claim 856, further comprising at least one ribonucleotide.

887. (NEW) The oligo- or polydexoxyribonucleotide of claim 856, having the structural formula:



wherein m and n represent integers from 0 up to about 100,000, and wherein said Sig moiety is attached to at least one of the phosphate moieties in said structural formula.

888. (NEW) An oligo- or polynucleotide which is complementary to a nucleic acid of interest or a portion thereof, said oligo- or polynucleotide comprising at least one modified nucleotide modified nucleotide analog having the formula



wherein PM is a phosphate moiety, SM is a furanosyl moiety and BASE is a base moiety or a base analog comprising a pyrimidine, a pyrimidine analog, a purine, a purine analog, a deazapurine or a deazapurine analog, wherein said analog can be

attached to or coupled to or incorporated into DNA or RNA, wherein said analog does not substantially interfere with double helix formation or nucleic acid hybridization, wherein said PM is attached to SM, said BASE is attached to SM, said Sig is covalently attached to PM directly or through a chemical linkage, non-nucleotidyl, and wherein said Sig comprises a non-polypeptide, non-radioactive label moiety which can be directly or indirectly detected when attached to PM or when said modified nucleotide is incorporated into said oligo- or polynucleotide or when said oligo- or polynucleotide is hybridized to said complementary nucleic acid of interest or a portion thereof, provided that when said oligo- or polynucleotide is an oligoribonucleotide or a polyribonucleotide, and when Sig is attached through a chemical linkage to a terminal PM at the 3' position of a terminal ribonucleotide, said chemical linkage is not obtained through a 2',3' vicinal oxidation of a 3' terminal ribonucleotide previously attached to said oligoribonucleotide or polyribonucleotide.

889. (NEW) The oligo- or polynucleotide of claim 888, wherein Sig comprises at least three carbon atoms.

890. (NEW) The oligo- or polynucleotide of claim 888, wherein Sig comprises biotin, iminobiotin, an electron dense component, a magnetic component, a metal-containing component, a fluorescent component, a chemiluminescent component, a chromogenic component, a saccharide component or a combination of any of the foregoing.

891. (NEW) The oligo- or polynucleotide of claim 890, wherein said magnetic component comprises magnetic oxide.

892. (NEW) The oligo- or polynucleotide of claim 891, wherein said magnetic oxide comprises ferric oxide.

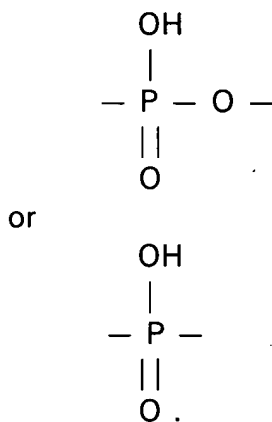
893. (NEW) The oligo- or polynucleotide of claim 890, wherein said metal-containing component is catalytic.

894. (NEW) The oligo- or polynucleotide of claim 890, wherein said fluorescent component comprises fluorescein, rhodamine or dansyl.

895. (NEW) The oligo- or polynucleotide of claim 890, wherein said saccharide component comprises a polysaccharide, an oligosaccharide or a monosaccharide.

896. (NEW) The oligo- or polynucleotide of claim 895, wherein said saccharide component comprises a monosaccharide.

897. (NEW) The oligo- or polynucleotide of claim 888, wherein said covalent attachment comprises:

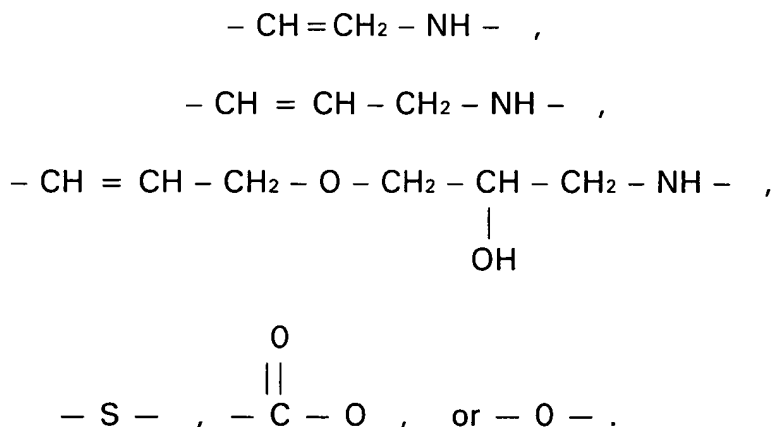


898. (NEW) The oligo- or polynucleotide of claim 888, wherein said chemical linkage does not interfere substantially with the characteristic ability of Sig to form a detectable signal.

899. (NEW) The oligo- or polynucleotide of claim 888, wherein said chemical linkage comprises a  $-\text{CH}_2\text{NH}-$  moiety.

900. (NEW) The oligo- or polynucleotide of claim 888, wherein said chemical linkage comprises an allylamine group.

901. (NEW) The oligo- or polynucleotide of claim 888, wherein said chemical linkage comprises any of the moieties:



902. (NEW) The oligo- or polynucleotide of claim 888, wherein said chemical linkage comprises a glycosidic linkage moiety.

903. (NEW) The oligo- or polynucleotide of claim 888, wherein said PM comprises a monophosphate, a diphosphate or a triphosphate.



904. (NEW) The oligo- or polynucleotide of claim 888, wherein said Sig moiety is covalently attached to said PM through a phosphorus atom or phosphate oxygen.

905. (NEW) The oligo- or polynucleotide of claim 888, wherein said Sig moiety is attached to the furanosyl moiety of a terminal nucleotide in said oligo- or polydeoxyribonucleotide.

906. (NEW) The oligo- or polynucleotide of claim 905, wherein the furanosyl moiety of said terminal nucleotide comprises a hydrogen atom at the 2' position thereof.

907. (NEW) The oligo- or polynucleotide of claim 905, wherein the furanosyl moiety of said terminal nucleotide comprises an oxygen atom at the 2' position thereof.

908. (NEW) The oligo- or polynucleotide of claim 906, wherein the furanosyl moiety of said terminal nucleotide comprises a hydrogen atom at the 3' position thereof.

909. (NEW) The oligo- or polynucleotide of claim 907, wherein the furanosyl moiety of said terminal nucleotide comprises an oxygen atom at the 3' position thereof.

910. (NEW) The oligo- or polynucleotide of claim 896, wherein said monosaccharide is attached to a terminal nucleotide in said oligo- or polydeoxyribonucleotide.

911. (NEW) The oligo- or polynucleotide of claim 888, wherein said furanosyl moiety comprises a ribose, a deoxyribose or a dideoxyribose.

912. (NEW) The oligo- or polynucleotide of claim 888, wherein said pyrimidine analogs comprise thymidine analogs, uridine analogs, deoxyuridine analogs, cytidine analogs, deoxycytidine analogs or a combination of any of the foregoing.

913. (NEW) The oligo- or polynucleotide of claim 912, wherein said uridine analogs comprise 5-bromo-2'-deoxyuridine-5'-phosphate.

914. (NEW) The oligo- or polynucleotide of claim 912, wherein said deoxycytidine analogs comprise 5-hydroxymethyl-2'-deoxycytidylic acid.

915. (NEW) The oligo- or polynucleotide of claim 888, wherein said purine analogs comprise adenosine analogs, deoxyadenosine analogs, guanosine analogs, deoxyguanosine analogs or a combination of any of the foregoing.

916. (NEW) The oligo- or polynucleotide of claim 915, wherein said adenosine analogs comprise tubericidin or toyocamycin.

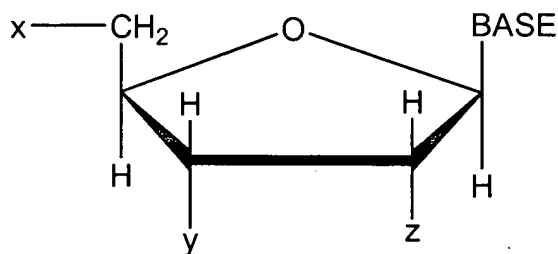
917. (NEW) The oligo- or polynucleotide of claim 888, wherein said oligo- or polynucleotide comprises an oligo- or polydeoxyribonucleotide.

918. (NEW) The oligo- or polynucleotide of claim 917, wherein said oligo- or polydeoxyribonucleotide further comprises at least one ribonucleotide.

919. (NEW) The oligo- or polynucleotide of claim 888, wherein said oligo- or polynucleotide comprises an oligo- or polyribonucleotide.

920. (NEW) The oligo- or polynucleotide of claim 919, wherein said oligo- or polyribonucleotide further comprises at least one deoxyribnucleotide.

921. (NEW) An oligo- or polynucleotide which is complementary to a nucleic acid of interest or a portion thereof, said oligo- or polynucleotide comprising at least one modified nucleotide or modified nucleotide analog having the structural formula:



wherein BASE is a moiety comprising a pyrimidine, a pyrimidine analog, a purine, a purine analog, a deazapurine or a deazapurine analog, wherein said pyrimidine analog, said purine analog or said deazapurine analog can be attached to or coupled to or incorporated into DNA or RNA, wherein said analog does not substantially interfere with double helix formation or nucleic acid hybridization, wherein said BASE is attached to the 1' position of the furanosyl ring from the N1 position when said BASE is a pyrimidine or pyrimidine analog, or from the N9 position of the furanosyl ring when said BASE is a purine, purine analog, a deazapurine or a deazapurine analog;

wherein x comprises H—, HO—, a mono-phosphate, a di-phosphate or a tri-phosphate;

wherein y comprises H—, HO—, a mono-phosphate, a di-phosphate or a tri-phosphate;

wherein z comprises H—, HO—, a mono-phosphate, a di-phosphate or a tri-phosphate; and

wherein Sig is covalently attached directly or through a chemical linkage to at least one phosphate comprising x, y and z, or a combination thereof, and wherein said Sig comprises a non-polypeptide, non-nucleotidyl, non-radioactive label moiety which can be directly or indirectly detected when so attached to said phosphate or when said modified nucleotide is incorporated into said oligo- or polynucleotide, or when said oligo- or polynucleotide is hybridized to said complementary nucleic acid of interest or a portion thereof, provided that when said oligo- or polynucleotide is an oligoribonucleotide or a polyribonucleotide and when Sig is attached through a chemical linkage to a terminal PM at the 3' position of a terminal ribonucleotide, said chemical linkage is not obtained through a 2',3' vicinal oxidation of a 3' terminal ribonucleotide previously attached to said oligoribonucleotide or polyribonucleotide.

922. (NEW) The oligo- or polynucleotide of claim 921, wherein Sig comprises at least three carbon atoms.

923. (NEW) The oligo- or polynucleotide of claim 921, wherein Sig comprises biotin, iminobiotin, an electron dense component, a magnetic component, a metal-containing component, a fluorescent component, a chemiluminescent component, a chromogenic component, a saccharide component or a combination of any of the foregoing.

924. (NEW) The oligo- or polynucleotide of claim 923, wherein said magnetic component comprises magnetic oxide.

925. (NEW) The oligo- or polynucleotide of claim 924, wherein said magnetic oxide comprises ferric oxide.

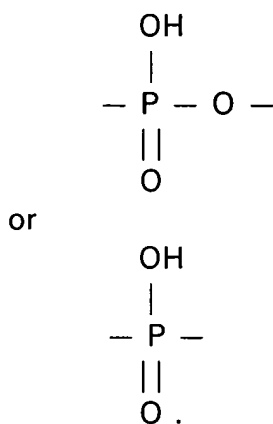
926. (NEW) The oligo- or polynucleotide of claim 923, wherein said metal-containing component is catalytic.

927. (NEW) The oligo- or polynucleotide of claim 923, wherein said fluorescent component comprises fluorescein, rhodamine or dansyl.

928. (NEW) The oligo- or polynucleotide of claim 923, wherein said saccharide component comprises a polysaccharide, an oligosaccharide or a monosaccharide.

929. (NEW) The oligo- or polynucleotide of claim 928, wherein said saccharide component comprises a monosaccharide.

930. (NEW) The oligo- or polynucleotide of claim 921, wherein said covalent attachment comprises

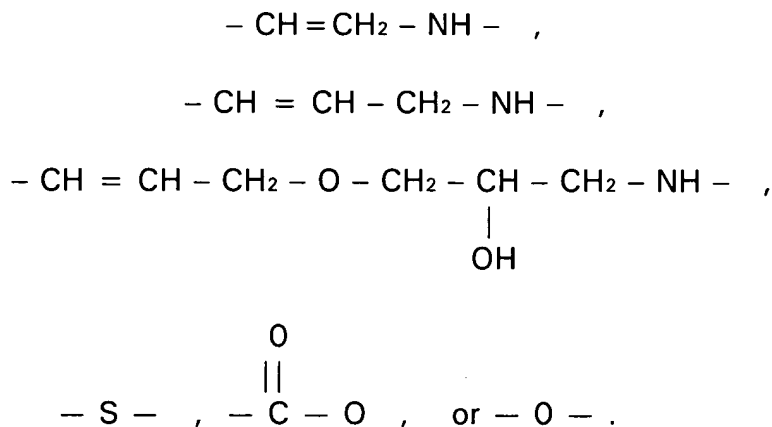


931. (NEW) The oligo- or polynucleotide of claim 921, wherein said chemical linkage does not interfere substantially with the characteristic ability of Sig to form a detectable signal.

932. (NEW) The oligo- or polynucleotide of claim 921, wherein said chemical linkage comprises a -CH<sub>2</sub>NH- moiety.

933. (NEW) The oligo- or polynucleotide of claim 921, wherein said chemical linkage comprises an allylamine group.

934. (NEW) The oligo- or polynucleotide of claim 921, wherein said chemical linkage comprises any of the moieties:



935. (NEW) The oligo- or polynucleotide of claim 921, wherein said chemical linkage comprises a glycosidic linkage moiety.

936. (NEW) The oligo- or polynucleotide of claim 921, wherein said x comprises a monophosphate, a diphosphate or a triphosphate and y comprises a monophosphate.

937. (NEW) The oligo- or polynucleotide of claim 921, wherein said Sig moiety is covalently attached to said phosphate through a phosphorus atom or phosphate oxygen.

938. (NEW) The oligo- or polynucleotide of claim 921, wherein said x comprises a monophosphate.

939. (NEW) The oligo- or polynucleotide of claim 921, wherein said Sig moiety is attached to the furanosyl moiety of a terminal nucleotide in said oligo- or polydeoxyribonucleotide.

940. (NEW) The oligo- or polynucleotide of claim 939, wherein z of said furanosyl moiety of said terminal nucleotide comprises a hydrogen atom.

941. (NEW) The oligo- or polynucleotide of claim 939, wherein z of said furanosyl moiety of said terminal nucleotide comprises an oxygen atom.

942. (NEW) The oligo- or polynucleotide of claim 940, wherein y of said furanosyl moiety comprises a hydrogen atom.

943. (NEW) The oligo- or polynucleotide of claim 941, wherein y of said furanosyl moiety comprises an oxygen atom.

944. (NEW) The oligo- or polynucleotide of claim 929, wherein said monosaccharide is attached to a terminal nucleotide in said oligo- or polydeoxyribonucleotide.

945. (NEW) The oligo- or polynucleotide of claim 921, wherein said furanosyl moiety comprises a ribose, a deoxyribose or a dideoxyribose.

946. (NEW) The oligo- or polynucleotide of claim 921, wherein said pyrimidine analogs comprise thymidine analogs, uridine analogs, deoxyuridine analogs, cytidine analogs, deoxycytidine analogs or a combination of any of the foregoing.

947. (NEW) The oligo- or polynucleotide of claim 946, wherein said uridine analogs comprise 5-bromo-2'-deoxyuridine-5'-phosphate.

948. (NEW) The oligo- or polynucleotide of claim 946, wherein said deoxycytidine analogs comprise 5-hydroxymethyl-2'-deoxycytidylic acid.

949. (NEW) The oligo- or polynucleotide of claim 921, wherein said purine analogs comprise adenosine analogs, deoxyadenosine analogs, guanosine analogs, deoxyguanosine analogs, or a combination of any of the foregoing.

950. (NEW) The oligo- or polynucleotide of claim 949, wherein said adenosine analogs comprise tubercidin or toyocamycin.

951. (NEW) The oligo- or polynucleotide of claim 921, further comprising at least one ribonucleotide.

952. (NEW) The oligo- or polynucleotide of claim 921, wherein said oligo- or polynucleotide comprises an oligo- or polydeoxyribonucleotide.

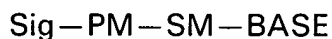
953. (NEW) The oligo- or polynucleotide of claim 952, wherein said oligo- or polydeoxyribonucleotide further comprises at least one ribonucleotide.

954. (NEW) The oligo- or polynucleotide of claim 921, wherein said oligo- or polynucleotide comprises an oligo- or polyribonucleotide.



955. (NEW) The oligo- or polynucleotide of claim 954, wherein said oligo- or polyribonucleotide further comprises at least one deoxyribonucleotide.

956. (NEW) An oligo- or polynucleotide which is complementary to a nucleic acid of interest or a portion thereof, said oligo- or polynucleotide comprising at least one modified nucleotide or modified nucleotide analog having the formula



wherein PM is a phosphate moiety, SM is a sugar moiety and BASE is a base moiety comprising a pyrimidine, a pyrimidine analog, a purine, a purine analog, a deazapurine or a deazapurine analog wherein said analog can be attached to or coupled to or incorporated into DNA or RNA wherein said analog does not substantially interfere with double helix formation or nucleic acid hybridization, said PM being attached to SM, said BASE being attached to SM, and said Sig being covalently attached to PM directly or through a chemical linkage, and wherein said Sig comprises a non-polypeptide, non-nucleotidyl, non-radioactive label moiety which can be directly or indirectly detected when attached to PM or when said modified nucleotide is incorporated into said oligo- or polynucleotide or when said oligo- or polynucleotide is hybridized to said complementary nucleic acid of interest or a portion thereof, and wherein Sig comprises biotin, iminobiotin, an electron dense component, a magnetic component, a metal-containing component, a fluorescent component, a chemiluminescent component, a chromogenic component, a saccharide component or a combination of any of the foregoing.

957. (NEW) The oligo- or polynucleotide of claim 956, wherein Sig comprises at least three carbon atoms.

958. (NEW) The oligo- or polynucleotide of claim 956, wherein said magnetic component comprises magnetic oxide.

959. (NEW) The oligo- or polynucleotide of claim 958, wherein said magnetic oxide comprises ferric oxide.

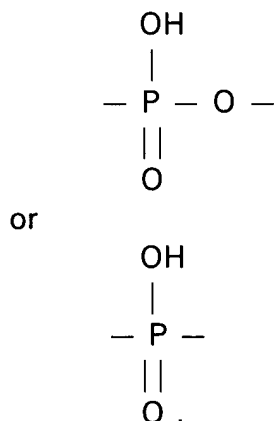
960. (NEW) The oligo- or polynucleotide of claim 956, wherein said metal-containing component is catalytic.

961. (NEW) The oligo- or polynucleotide of claim 956, wherein said fluorescent component comprises fluorescein, rhodamine or dansyl.

962. (NEW) The oligo- or polynucleotide of claim 956, wherein said saccharide component comprises a polysaccharide, an oligosaccharide or a monosaccharide.

963. (NEW) The oligo- or polynucleotide of claim 962, wherein Sig comprises a monosaccharide.

964. (NEW) The oligo- or polynucleotide of claim 956, wherein said covalent attachment comprises

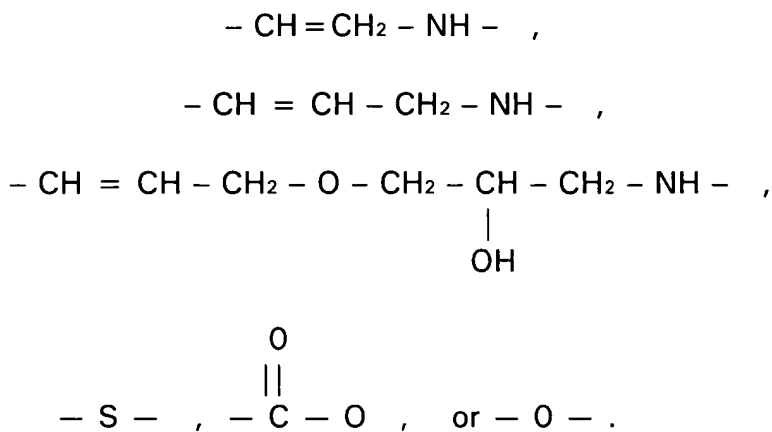


965. (NEW) The oligo- or polynucleotide of claim 956, wherein said chemical linkage does not interfere substantially with the characteristic ability of Sig to form a detectable signal.

966. (NEW) The oligo- or polynucleotide of claim 956, wherein said chemical linkage comprises a -CH<sub>2</sub>NH- moiety.

967. (NEW) The oligo- or polynucleotide of claim 956, wherein said chemical linkage comprises an allylamine group.

968. (NEW) The oligo- or polynucleotide of claim 956, wherein said chemical linkage comprises any of the moieties:



969. (NEW) The oligo- or polynucleotide of claim 956, wherein said chemical linkage comprises a glycosidic linkage moiety.

970. (NEW) The oligo- or polynucleotide of claim 956, wherein said PM comprises a monophosphate, a diphosphate or a triphosphate.

971. (NEW) The oligo- or polynucleotide of claim 956, wherein said Sig moiety is covalently attached to said PM through a phosphorus atom or phosphate oxygen.

972. (NEW) The oligo- or polynucleotide of claim 956, wherein said Sig moiety is attached to the furanosyl moiety of a terminal nucleotide in said oligo- or polydeoxyribonucleotide.

973. (NEW) The oligo- or polynucleotide of claim 972, wherein the furanosyl moiety of said terminal nucleotide comprises a hydrogen atom at the 2' position thereof.

974. (NEW) The oligo- or polynucleotide of claim 972, wherein the furanosyl moiety of said terminal nucleotide comprises an oxygen atom at the 2' position thereof.

975. (NEW) The oligo- or polynucleotide of claim 973, wherein the furanosyl moiety of said terminal nucleotide comprises a hydrogen atom at the 3' position thereof.

976. (NEW) The oligo- or polynucleotide of claim 974, wherein the furanosyl moiety of said terminal nucleotide comprises an oxygen atom at the 3' position thereof.

977. (NEW) The oligo- or polynucleotide of claim 963, wherein said monosaccharide is attached to a terminal nucleotide in said oligo- or polydeoxyribonucleotide.

978. (NEW) The oligo- or polynucleotide of claim 956, wherein said furanosyl moiety comprises a ribose, a deoxyribose or a dideoxyribose.

979. (NEW) The oligo- or polynucleotide of claim 956, wherein said pyrimidine analogs comprise thymidine analogs, uridine analogs, deoxyuridine analogs, cytidine analogs, deoxycytidine analogs or a combination of any of the foregoing.

980. (NEW) The oligo- or polynucleotide of claim 979, wherein said uridine analogs comprise 5-bromo-2'-deoxyuridine-5'-phosphate.

981. (NEW) The oligo- or polynucleotide of claim 979, wherein said deoxycytidine analogs comprise 5-hydroxymethyl-2'-deoxycytidylic acid.

982. (NEW) The oligo- or polynucleotide of claim 956, wherein said purine analogs comprise adenosine analogs, deoxyadenosine analogs, guanosine analogs, deoxyguanosine analogs or a combination of any of the foregoing.

983. (NEW) The oligo- or polynucleotide of claim 982, wherein said adenosine analogs comprise tubericidin and toyocamycin.

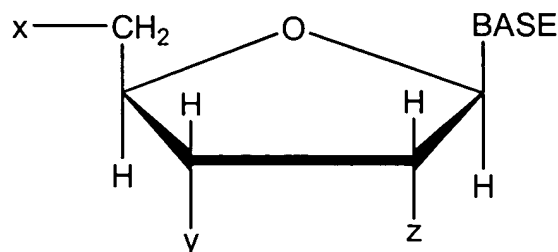
984. (NEW) The oligo- or polynucleotide of claim 956, wherein said oligo- or polynucleotide comprises an oligo- or polydeoxyribonucleotide.

985. (NEW) The oligo- or polynucleotide of claim 984, wherein said oligo- or polydeoxyribonucleotide further comprises at least one ribonucleotide.

986. (NEW) The oligo- or polynucleotide of claim 956, wherein said oligo- or polynucleotide comprises an oligo- or polyribonucleotide.

987. (NEW) The oligo- or polynucleotide of claim 986, wherein said oligo- or polyribonucleotide further comprises at least one deoxyribnucleotide.

988. (NEW) An oligo- or polynucleotide which is complementary to a nucleic acid of interest or a portion thereof, said oligo- or polynucleotide comprising at least one modified nucleotide or a modified nucleotide analog having the structural formula:



wherein BASE is a moiety comprising a pyrimidine, a pyrimidine analog, a purine, a purine analog, a deazapurine or a deazapurine analog, wherein said analog, can be attached to or coupled to or incorporated into DNA or RNA, wherein said analog does not substantially interfere with double helix formation or nucleic acid hybridization, and wherein said BASE is attached to the 1' position of the furanosyl ring from the N1 position when said BASE is a pyrimidine or a pyrimidine analog, or from the N9 position when said BASE is a purine, a purine analog, a deazapurine or a deazapurine analog;

wherein x comprises  $\text{H}-$ ,  $\text{HO}-$ , a mono-phosphate, a di-phosphate or a tri-phosphate;

wherein y comprises  $\text{H}-$ ,  $\text{HO}-$ , a mono-phosphate, a di-phosphate or a tri-phosphate;

wherein z comprises  $\text{H}-$ ,  $\text{HO}-$ , a mono-phosphate, a di-phosphate or a tri-phosphate; and

wherein Sig is covalently attached directly or through a chemical linkage to at least one phosphate comprising x, y, z, or a combination thereof, and wherein said Sig comprises a non-polypeptide, non-nucleotidyl, non-radioactive label moiety which can be directly or indirectly detected when attached to said phosphate or when said modified nucleotide is incorporated into said oligo- or polynucleotide or when said oligo- or polynucleotide is hybridized to said complementary nucleic acid of interest or a portion thereof, wherein Sig comprises biotin, iminobiotin, an electron dense component, a magnetic component, a metal-containing component, a

fluorescent component, a chemiluminescent component, a chromogenic component, a saccharide component or a combination of any of the foregoing.

989. (NEW) The oligo- or polynucleotide of claim 988, wherein Sig comprises at least three carbon atoms.

990. (NEW) The oligo- or polynucleotide of claim 988, wherein said magnetic component comprises magnetic oxide.

991. (NEW) The oligo- or polynucleotide of claim 990, wherein said magnetic oxide comprises ferric oxide.

992. (NEW) The oligo- or polynucleotide of claim 988, wherein said metal-containing component is catalytic.

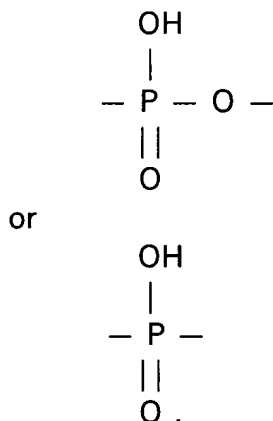
993. (NEW) The oligo- or polynucleotide of claim 988, wherein said fluorescent component comprises fluorescein, rhodamine or dansyl.

994. (NEW) The oligo- or polynucleotide of claim 988, wherein said saccharide component comprises a polysaccharide, an oligosaccharide or a monosaccharide.

995. (NEW) The oligo- or polydeoxynucleotide of claim 994, wherein Sig comprises a monosaccharide.



996. (NEW) The oligo- or polynucleotide of claim 988, wherein said covalent attachment comprises

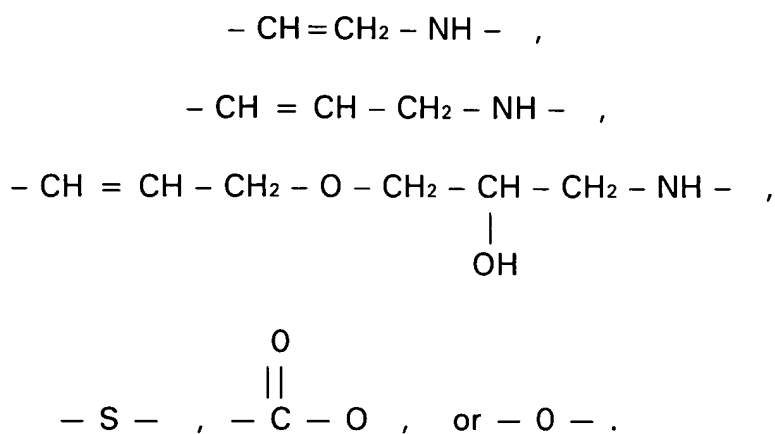


997. (NEW) The oligo- or polynucleotide of claim 988, wherein said chemical linkage does not interfere substantially with the characteristic ability of Sig to form a detectable signal.

998. (NEW) The oligo- or polynucleotide of claim 988, wherein said chemical linkage comprises a -CH<sub>2</sub>NH- moiety.

999. (NEW) The oligo- or polynucleotide of claim 988, wherein said chemical linkage comprises an allylamine group.

1000. (NEW) The oligo- or polynucleotide of claim 988, wherein said chemical linkage comprises any of the moieties:



1001. (NEW) The oligo- or polynucleotide of claim 988, wherein said chemical linkage comprises a glycosidic linkage moiety.

1002. (NEW) The oligo- or polynucleotide of claim 988, wherein said x comprises a monophosphate, a diphosphate or a triphosphate and y comprises a monophosphate.

1003. (NEW) The oligo- or polynucleotide of claim 988, wherein said Sig moiety is covalently attached to said phosphate through a phosphorus atom or phosphate oxygen.

1004. (NEW) The oligo- or polynucleotide of claim 988, wherein said x comprises a monophosphate.

1005. (NEW) The oligo- or polynucleotide of claim 988, wherein said Sig moiety is attached to the furanosyl moiety of a terminal nucleotide in said oligo- or polynucleotide.

1006. (NEW) The oligo- or polynucleotide of claim 1005, wherein z of said furanosyl moiety of said terminal nucleotide comprises a hydrogen atom.

1007. (NEW) The oligo- or polynucleotide of claim 1005, wherein z of said furanosyl moiety of said terminal nucleotide comprises an oxygen atom.

1008. (NEW) The oligo- or polynucleotide of claim 1006, wherein y of said furanosyl moiety comprises a hydrogen atom.

1009. (NEW) The oligo- or polynucleotide of claim 1007, wherein y of said furanosyl moiety comprises an oxygen atom.

1010. (NEW) The oligo- or polynucleotide of claim 995, wherein said monosaccharide is attached to a terminal nucleotide in said oligo- or polynucleotide.

1011. (NEW) The oligo- or polynucleotide of claim 988, wherein said furanosyl moiety comprises a ribose, a deoxyribose or a dideoxyribose.

1012. (NEW) The oligo- or polynucleotide of claim 988, wherein said pyrimidine analogs comprise thymidine analogs, uridine analogs, deoxyuridine analogs, cytidine analogs, deoxycytidine analogs or a combination of any of the foregoing.

1013. (NEW) The oligo- or polynucleotide of claim 1012, wherein said uridine analogs comprise 5-bromo-2'-deoxyuridine-5'-phosphate.

1014. (NEW) The oligo- or polynucleotide of claim 1012, wherein said deoxycytidine analogs comprise 5-hydroxymethyl-2'-deoxycytidylic acid.

1015. (NEW) The oligo- or polynucleotide of claim 988, wherein said purine analogs comprise adenosine analogs, deoxyadenosine analogs, guanosine analogs, deoxyguanosine analogs, or a combination of any of the foregoing.

1016. (NEW) The oligo- or polynucleotide of claim 1015, wherein said adenosine analogs comprise tubericidin or toyocamycin.

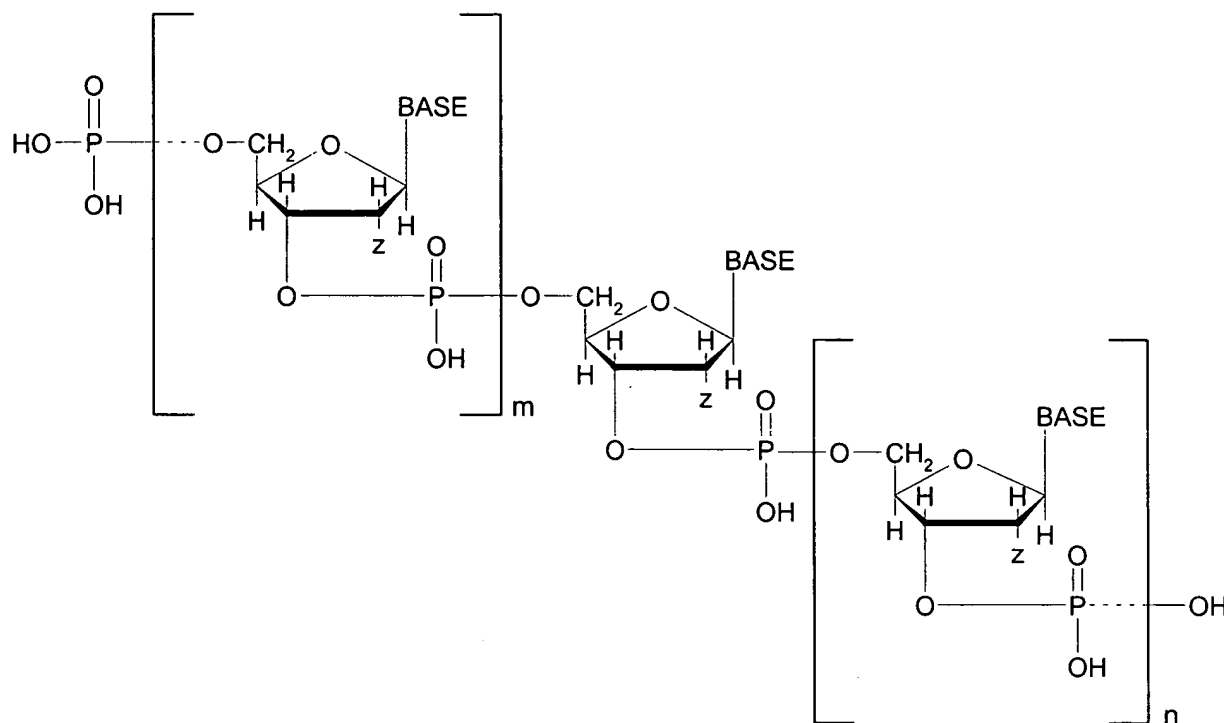
1017. (NEW) The oligo- or polynucleotide of claim 988, wherein said oligo- or polynucleotide comprises an oligo- or polydeoxyribonucleotide.

1018. (NEW) The oligo- or polynucleotide of claim 1017, wherein said oligo- or polydeoxyribonucleotide further comprises at least one ribonucleotide.

1019. (NEW) The oligo- or polynucleotide of claim 988, wherein said oligo- or polynucleotide comprises an oligo- or polyribonucleotide.

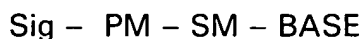
1020. (NEW) The oligo- or polynucleotide of claim 1019, wherein said oligo- or polyribonucleotide further comprises at least one deoxyribnucleotide.

1021. (NEW) The oligo- or polynucleotide of claim 988, having the structural formula:



wherein *m* and *n* represent integers from 0 up to about 100,000, and wherein said Sig moiety is attached to at least one of the phosphate moieties in said structural formula.

1022. (NEW) An oligo- or polynucleotide which is complementary to a nucleic acid of interest or a portion thereof, said oligo- or polynucleotide comprising at least one modified nucleotide or a modified nucleotide analog having the formula



wherein PM is a phosphate moiety, SM is a furanosyl moiety and BASE is a base moiety comprising a pyrimidine, a pyrimidine analog, a purine, a purine analog, a deazapurine or a deazapurine analog, wherein said analog can be attached to or coupled to or incorporated into DNA or RNA, wherein said analog does not

substantially interfere with double helix formation or nucleic acid hybridization, said PM is attached to SM, said BASE is attached to SM, said Sig is covalently attached to PM directly or via a chemical linkage, and wherein said Sig comprises a non-polypeptide, non-nucleotidyl, non-radioactive label moiety which can be directly or indirectly detected when attached to PM or when said modified nucleotide is incorporated into said oligo- or polynucleotide, or when said oligo- or polynucleotide is hybridized to said complementary nucleic acid of interest or a portion thereof, provided that when said oligo- or polynucleotide is an oligoribonucleotide or a polyribonucleotide, and when Sig is attached through a chemical linkage to a terminal PM at the 3' position of a terminal ribonucleotide, said chemical linkage is not obtained through a 2',3' vicinal oxidation of a 3' terminal ribonucleotide previously attached to said oligoribonucleotide or polyribonucleotide, and wherein said Sig comprises biotin, iminobiotin, an electron dense component, a magnetic component, a metal-containing component, a fluorescent component, a chemiluminescent component, a chromogenic component, a saccharide component or a combination of any of the foregoing.

1023. (NEW) The oligo- or polynucleotide of claim 1022, wherein Sig comprises at least three carbon atoms.

1024. (NEW) The oligo- or polynucleotide of claim 1022, wherein said magnetic component comprises magnetic oxide.

1025. (NEW) The oligo- or polynucleotide of claim 1024, wherein said magnetic oxide comprises ferric oxide.

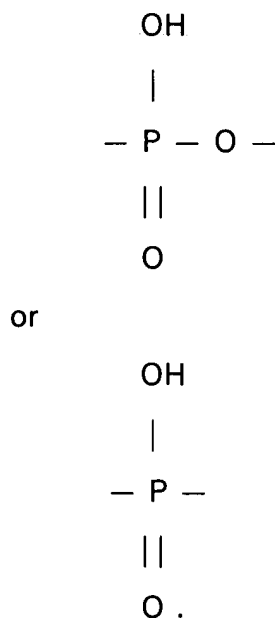
1026. (NEW) The oligo- or polynucleotide of claim 1022, wherein said metal-containing component is catalytic.

1027. (NEW) The oligo- or polynucleotide of claim 1022, wherein said fluorescent component comprises fluorescein, rhodamine or dansyl.

1028. (NEW) The oligo- or polynucleotide of claim 1022, wherein said saccharide component comprises a polysaccharide, an oligosaccharide or a monosaccharide.

1029. (NEW) The oligo- or polynucleotide of claim 1022, wherein said saccharide component comprises a monosaccharide.

1030. (NEW) The oligo- or polynucleotide of claim 1022, wherein said covalent attachment comprises

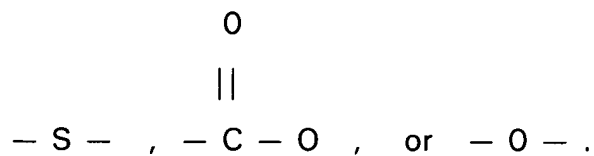
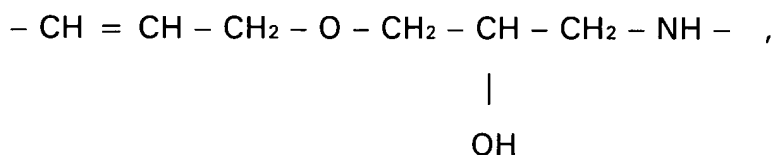
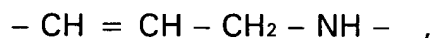
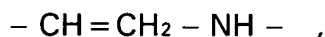


1031. (NEW) The oligo- or polynucleotide of claim 1022, wherein said chemical linkage does not interfere substantially with the characteristic ability of Sig to form a detectable signal.

1032. (NEW) The oligo- or polynucleotide of claim 1022, wherein said chemical linkage comprises a -CH<sub>2</sub>NH- moiety.

1033. (NEW) The oligo- or polynucleotide of claim 1022, wherein said chemical linkage comprises an allylamine group.

1034. (NEW) The oligo- or polynucleotide of claim 1022, wherein said chemical linkage comprises any of the moieties:



1035. (NEW) The oligo- or polynucleotide of claim 1022, wherein said chemical linkage comprises a glycosidic linkage moiety.



1036. (NEW) The oligo- or polynucleotide of claim 1022, wherein said PM comprises a monophosphate, a diphosphate or a triphosphate.

1037. (NEW) The oligo- or polynucleotide of claim 1022, wherein said Sig moiety is covalently attached to said PM through a phosphorus atom or phosphate oxygen.

1038. (NEW) The oligo- or polynucleotide of claim 1022, wherein said Sig moiety is attached to the furanosyl moiety of a terminal nucleotide in said oligo- or polynucleotide.

1039. (NEW) The oligo- or polynucleotide of claim 1038, wherein the furanosyl moiety of said terminal nucleotide has a hydrogen atom at the 2' position thereof.

1040. (NEW) The oligo- or polynucleotide of claim 1038, wherein the furanosyl moiety of said terminal nucleotide has an oxygen atom at the 2' position thereof.

1041. (NEW) The oligo- or polynucleotide of claim 1039, wherein the furanosyl moiety of said terminal nucleotide has a hydrogen atom at the 3' position thereof.

1042. (NEW) The oligo- or polynucleotide of claim 1040, wherein the furanosyl moiety of said terminal nucleotide has an oxygen atom at the 3' position thereof.

1043. (NEW) The oligo- or polynucleotide of claim 1029, wherein said monosaccharide is attached to a terminal nucleotide in said oligo- or polynucleotide.

1044. (NEW) The oligo- or polynucleotide of claim 1022, wherein said furanosyl moiety comprises a ribose, a deoxyribose or a dideoxyribose.

1045. (NEW) The oligo- or polynucleotide of claim 1022, wherein said pyrimidine analogs comprise thymidine analogs, uridine analogs, deoxyuridine analogs, cytidine analogs, deoxycytidine analogs or a combination of any of the foregoing.

1046. (NEW) The oligo- or polynucleotide of claim 1045, wherein said uridine analogs comprise 5-bromo-2'-deoxyuridine-5'-phosphate.

1047. (NEW) The oligo- or polynucleotide of claim 1045, wherein said deoxycytidine analogs comprise 5-hydroxymethyl-2'-deoxycytidylic acid.

1048. (NEW) The oligo- or polynucleotide of claim 1022, wherein said purine analogs comprise adenosine analogs, deoxyadenosine analogs, guanosine analogs, deoxyguanosine analogs or a combination of any of the foregoing.

1049. (NEW) The oligo- or polynucleotide of claim 1048, wherein said adenosine analogs comprise tubercidin and toyocamycin.

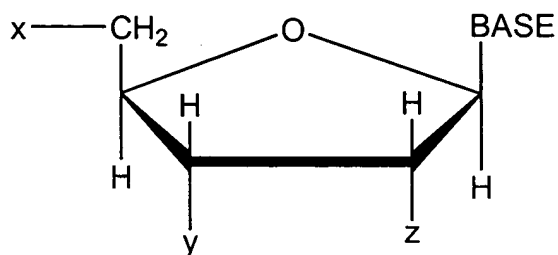
1050. (NEW) The oligo- or polynucleotide of claim 1022, wherein said oligo- or polynucleotide comprises an oligo- or polydeoxyribonucleotide.

1051. (NEW) The oligo- or polynucleotide of claim 1050, wherein said oligo- or polydeoxyribonucleotide further comprises at least one ribonucleotide.

1052. (NEW) The oligo- or polynucleotide of claim 1022, wherein said oligo- or polynucleotide comprises an oligo- or polyribonucleotide.

1053. (NEW) The oligo- or polynucleotide of claim 1052, wherein said oligo- or polyribonucleotide further comprises at least one deoxyribnucleotide.

1054. (NEW) An oligo- or polynucleotide which is complementary to a nucleic acid of interest or a portion thereof, said oligo- or polynucleotide comprising at least one modified nucleotide or a modified nucleotide analog having the structural formula:



wherein BASE is a moiety comprising a pyrimidine, a pyrimidine analog, a purine, a purine analog, a deazapurine, a deazapurine analog, wherein said analog can be attached to or coupled to or incorporated into DNA or RNA wherein said analog does not substantially interfere with double helix formation or nucleic acid hybridization, and wherein BASE is attached to the 1' position of the furanosyl ring from the N1 position when BASE is a pyrimidine or a pyrimidine analog, from the N9 position of the furanosyl ring when BASE is a purine, a purine analog, a deazapurine or a deazapurine;

wherein x comprises of H—, HO—, a mono-phosphate, a di-phosphate or a tri-phosphate;

wherein y comprises of H—, HO—, a mono-phosphate, a di-phosphate or a tri-phosphate;

wherein z comprises of H—, HO—, a mono-phosphate, a di-phosphate or a tri-phosphate; and

wherein said Sig is covalently attached directly or through a chemical linkage to at least one phosphate comprising of x, y and z, or a combination thereof, and wherein said Sig comprises a non-polypeptide, non-nucleotidyl, non-radioactive

label moiety which can be directly or indirectly detected when so attached to said phosphate or when said modified nucleotide is incorporated into said oligo- or polynucleotide, or when said oligo- or polynucleotide is hybridized to said complementary nucleic acid of interest or a portion thereof, provided that when said oligo- or polynucleotide is an oligoribonucleotide or a polyribonucleotide and when Sig is attached through a chemical linkage to a terminal PM at the 3' position of a terminal ribonucleotide, said chemical linkage is not obtained through a 2',3' vicinal oxidation of a 3' terminal ribonucleotide previously attached to said oligoribonucleotide or polyribonucleotide, and wherein Sig comprises biotin, iminobiotin, an electron dense component, a magnetic component, a metal-containing component, a fluorescent component, a chemiluminescent component, a chromogenic component, a saccharide component, or a combination of any of the foregoing.

1055. (NEW) The oligo- or polynucleotide of claim 1054, wherein Sig comprises at least three carbon atoms.

1056. (NEW) The oligo- or polynucleotide of claim 1054, wherein said magnetic component comprises magnetic oxide.

1057. (NEW) The oligo- or polynucleotide of claim 1056, wherein said magnetic oxide comprises ferric oxide.

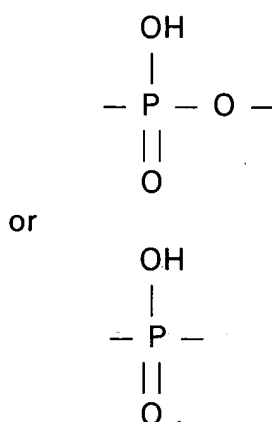
1058. (NEW) The oligo- or polynucleotide of claim 1054, wherein said metal-containing component is catalytic.

1059. (NEW) The oligo- or polynucleotide of claim 1054, wherein said fluorescent component comprises fluorescein, rhodamine or dansyl.

1060. (NEW) The oligo- or polynucleotide of claim 1054, wherein said saccharide component comprises a polysaccharide, an oligosaccharide or a monosaccharide.

1061. (NEW) The oligo- or polynucleotide of claim 1054, wherein said saccharide component comprises a monosaccharide.

1062. (NEW) The oligo- or polynucleotide of claim 1054, wherein said covalent attachment comprises

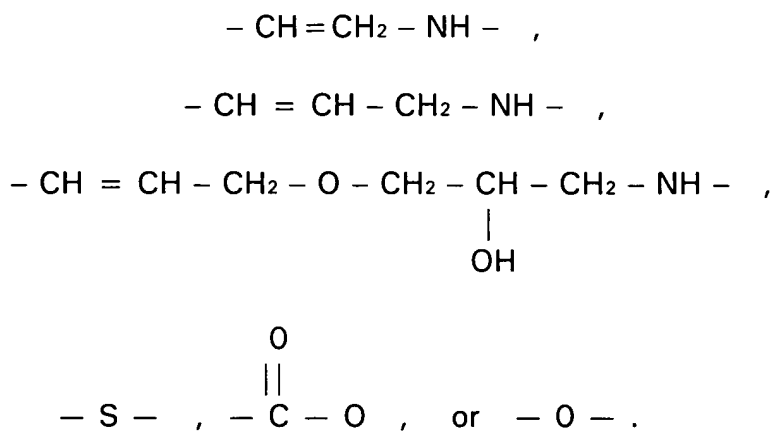


1063. (NEW) The oligo- or polynucleotide of claim 1054, wherein said chemical linkage does not interfere substantially with the characteristic ability of Sig to form a detectable signal.

1064. (NEW) The oligo- or polynucleotide of claim 1054, wherein said chemical linkage comprises a -CH<sub>2</sub>NH- moiety.

1065. (NEW) The oligo- or polynucleotide of claim 1054, wherein said chemical linkage comprises an allylamine group.

1066. (NEW) The oligo- or polynucleotide of claim 1054, wherein said chemical linkage comprises any of the moieties:



1067. (NEW) The oligo- or polynucleotide of claim 1054, wherein said chemical linkage comprises a glycosidic linkage moiety.

1068. (NEW) The oligo- or polynucleotide of claim 1054, wherein said x comprises a monophosphate, a diphosphate or a triphosphate and y comprises a monophosphate.

1069. (NEW) The oligo- or polynucleotide of claim 1054, wherein said Sig moiety is covalently attached to said phosphate through a phosphorus atom or phosphate oxygen.

1070. (NEW) The oligo- or polynucleotide of claim 1054, wherein said x comprises a monophosphate.

1071. (NEW) The oligo- or polynucleotide of claim 1054, wherein said Sig moiety is attached to the furanosyl moiety of a terminal nucleotide in said oligo- or polynucleotide.

1072. (NEW) The oligo- or polynucleotide of claim 1071, wherein z of said furanosyl moiety of said terminal nucleotide comprises a hydrogen atom.

1073. (NEW) The oligo- or polynucleotide of claim 1071, wherein z of said furanosyl moiety of said terminal nucleotide comprises an oxygen atom.

1074. (NEW) The oligo- or polynucleotide of claim 1072, wherein y of said furanosyl moiety comprises a hydrogen atom.

1075. (NEW) The oligo- or polynucleotide of claim 1073, wherein y of said furanosyl moiety comprises an oxygen atom.

1076. (NEW) The oligo- or polynucleotide of claim 1061, wherein said monosaccharide is attached to a terminal nucleotide in said oligo- or polynucleotide.

1077. (NEW) The oligo- or polynucleotide of claim 1054, wherein said furanosyl moiety comprises a ribose, a deoxyribose or a dideoxyribose.

1078. (NEW) The oligo- or polynucleotide of claim 1054, wherein said pyrimidine analogs comprise thymidine analogs, uridine analogs, deoxyuridine analogs, cytidine analogs, deoxycytidine analogs or a combination of any of the foregoing.

1079. (NEW) The oligo- or polynucleotide of claim 1078, wherein said uridine analogs comprise 5-bromo-2'-deoxyuridine-5'-phosphate.

1080. (NEW) The oligo- or polynucleotide of claim 1078, wherein said deoxycytidine analogs comprise 5-hydroxymethyl-2'-deoxycytidylic acid.

1081. (NEW) The oligo- or polynucleotide of claim 1054, wherein said purine analogs comprise adenosine analogs, deoxyadenosine analogs, guanosine analogs, deoxyguanosine analogs, or a combination of any of the foregoing.

1082. (NEW) The oligo- or polynucleotide of claim 1081, wherein said adenosine analogs comprise tubericidin or toyocamycin.

1083. (NEW) The oligo- or polynucleotide of claim 1054, wherein said oligo- or polynucleotide comprises an oligo- or polydeoxyribonucleotide.

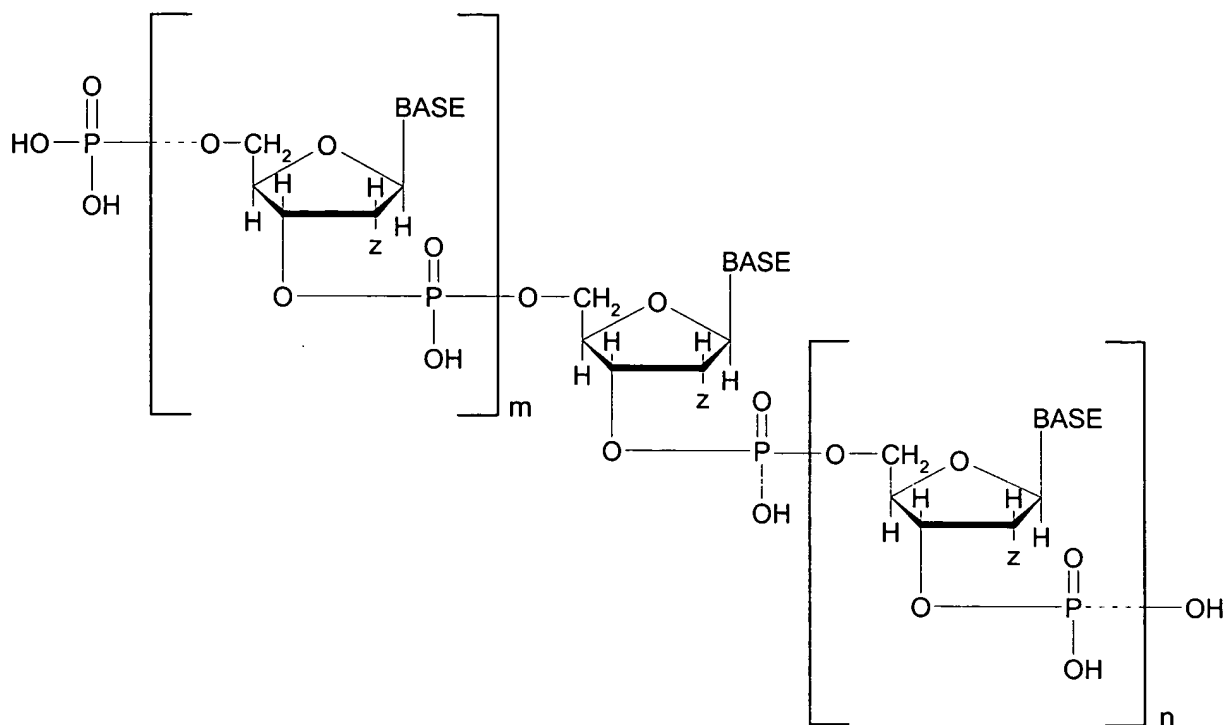
1084. (NEW) The oligo- or polynucleotide of claim 1083, wherein said oligo- or polydeoxyribonucleotide further comprises at least one ribonucleotide.

1085. (NEW) The oligo- or polynucleotide of claim 1054, wherein said oligo- or polynucleotide comprises an oligo- or polyribonucleotide.

1086. (NEW) The oligo- or polynucleotide of claim 1085, wherein said oligo- or polyribonucleotide further comprises at least one deoxyribnucleotide.

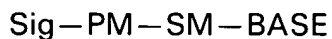


1087. (NEW) The oligo- or polynucleotide of claim 1054, having the structural formula:



wherein *m* and *n* represent integers from 0 up to about 100,000, and wherein said Sig moiety is attached to at least one of the phosphate moieties in said structural formula.

1088. (NEW) An oligo- or polydeoxyribonucleotide which is complementary to a nucleic acid of interest or a portion thereof, said oligo- or polydeoxyribonucleotide comprising at least one modified nucleotide or a modified nucleotide analog having the formula



wherein PM is a phosphate moiety, SM is a furanosyl moiety and BASE is a base moiety comprising a pyrimidine, a pyrimidine analog, a purine, a purine analog, a

deazapurine or a deazapurine analog, wherein said analog can be attached to or coupled to or incorporated into DNA or RNA, wherein said analog does not substantially interfere with double helix formation or nucleic acid hybridization, wherein said PM is attached to SM, said BASE is attached to SM, said Sig is covalently attached to PM through a chemical linkage comprising a polypeptide, and wherein said Sig comprises a non-polypeptide, non-nucleotidyl, non-radioactive label moiety which can be directly detected when indirectly attached to PM through said polypeptide chemical linkage or when said modified nucleotide is incorporated into said oligo- or polydeoxyribonucleotide or when said oligo- or polydeoxyribonucleotide is hybridized to said complementary nucleic acid of interest or a portion thereof.

1089. (NEW) The oligo- or polydeoxyribonucleotide of claim 1088, wherein Sig comprises at least three carbon atoms.

1090. (NEW) The oligo- or polydeoxyribonucleotide of claim 1088, wherein Sig comprises biotin, iminobiotin, an electron dense component, a magnetic component, a metal-containing component, a fluorescent component, a chemiluminescent component, a chromogenic component, a saccharide component or a combination of any of the foregoing.

1091. (NEW) The oligo- or polydeoxyribonucleotide of claim 1090, wherein said magnetic component comprises magnetic oxide.

1092. (NEW) The oligo- or polydeoxyribonucleotide of claim 1091, wherein said magnetic oxide comprises ferric oxide.

1093. (NEW) The oligo- or polydeoxyribonucleotide of claim 1090, wherein said metal-containing component is catalytic.

1094. (NEW) The oligo- or polydeoxyribonucleotide of claim 1090, wherein said fluorescent component comprises fluorescein, rhodamine or dansyl.

1095. (NEW) The oligo- or polydeoxyribonucleotide of claim 1090, wherein said saccharide component comprises a polysaccharide, an oligosaccharide or a monosaccharide.

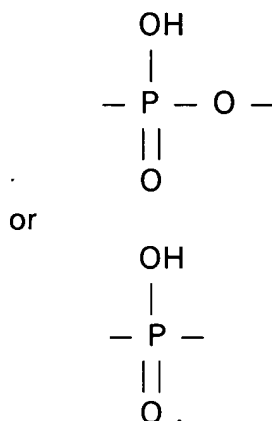
1096. (NEW) The oligo- or polydeoxynucleotide of claim 1095, wherein said saccharide component comprises a monosaccharide.

1097. (NEW) The oligo- or polydeoxyribonucleotide of claim 1088, wherein said polypeptide chemical linkage comprises polylysine.

1098. (NEW) The oligo- or polydeoxyribonucleotide of claim 1088, wherein said polypeptide chemical linkage comprises avidin, streptavidin or anti-hapten immunoglobulin.

1099. (NEW) The oligo- or polydeoxyribonucleotide of claim 1088, wherein said Sig moiety is attached via said polypeptide chemical linkage to a phosphate moiety in a terminal nucleotide in said oligo- or polydeoxyribonucleotide.

1100. (NEW) The oligo- or polydeoxyribonucleotide of claim 1088, wherein said covalent attachment comprises

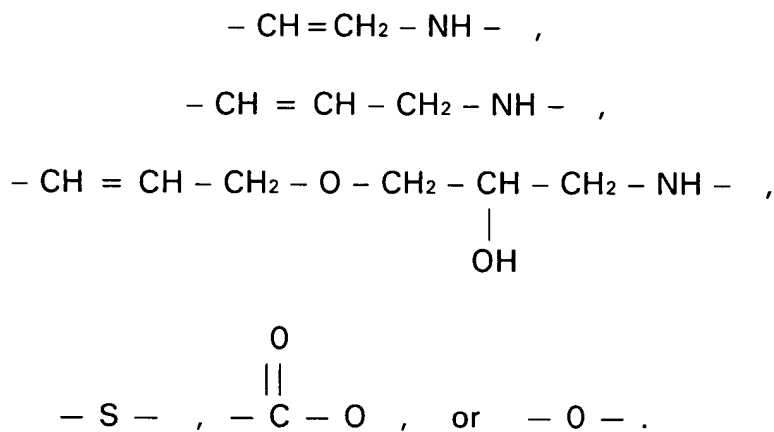


1101. (NEW) The oligo- or polydeoxyribonucleotide of claim 1088, wherein said polypeptide chemical linkage does not interfere substantially with the characteristic ability of Sig to form a detectable signal.

1102. (NEW) The oligo- or polydeoxyribonucleotide of claim 1088, wherein said polypeptide chemical linkage comprises a  $-\text{CH}_2\text{NH}-$  moiety.

1103. (NEW) The oligo- or polydeoxyribonucleotide of claim 1088, wherein said polypeptide chemical linkage comprises an allylamine group.

1104. (NEW) The oligo- or polydeoxyribonucleotide of claim 1088, wherein said polypeptide chemical linkage further comprises any of the moieties:



1105. (NEW) The oligo- or polydeoxyribonucleotide of claim 1088, wherein said polypeptide chemical linkage comprises a glycosidic linkage moiety.

1106. (NEW) The oligo- or polydeoxyribonucleotide of claim 1088, wherein said PM comprises a monophosphate, a diphosphate or a triphosphate.

1107. (NEW) The oligo- or polydeoxyribonucleotide of claim 1088, wherein said Sig moiety is covalently indirectly attached to said PM through a phosphorus atom or phosphate oxygen.

1108. (NEW) The oligo- or polydeoxyribonucleotide of claim 1088, wherein said Sig moiety is attached via said polypeptide chemical linkage to a furanosyl moiety in a terminal nucleotide in said oligo- or polydeoxyribonucleotide.

1109. (NEW) The oligo- or polydeoxyribonucleotide of claim 1108, wherein the furanosyl moiety of said terminal nucleotide comprises a hydrogen atom at the 2' position thereof.

1110. (NEW) The oligo- or polydeoxyribonucleotide of claim 1108, wherein the furanosyl moiety of said terminal nucleotide comprises an oxygen atom at the 2' position thereof.

1111. (NEW) The oligo- or polydeoxyribonucleotide of claim 1109, wherein the furanosyl moiety of said terminal nucleotide comprises a hydrogen atom at the 3' position thereof.

1112. (NEW) The oligo- or polydeoxyribonucleotide of claim 1110, wherein the furanosyl moiety of said terminal nucleotide comprises an oxygen atom at the 3' position thereof.

1113. (NEW) The oligo- or polydeoxyribonucleotide of claim 1096, wherein said monosaccharide is attached to a terminal nucleotide in said oligo- or polydeoxyribonucleotide.

1114. (NEW) The oligo- or polydeoxyribonucleotide of claim 1088, wherein said furanosyl moiety comprises a ribose, a deoxyribose or a dideoxyribose.

1115. (NEW) The oligo- or polydeoxyribonucleotide of claim 1088, wherein said pyrimidine analogs comprise thymidine analogs, uridine analogs, deoxyuridine analogs, cytidine analogs, deoxycytidine analogs or a combination of any of the foregoing.

1116. (NEW) The oligo- or polydeoxyribonucleotide of claim 1115, wherein said uridine analogs comprise 5-bromo-2'-deoxyuridine-5'-phosphate.

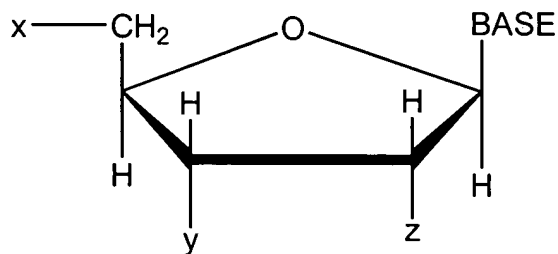
1117. (NEW) The oligo- or polydeoxyribonucleotide of claim 1115, wherein said deoxycytidine analogs comprise 5-hydroxymethyl-2'-deoxycytidylic acid.

1118. (NEW) The oligo- or polydeoxyribonucleotide of claim 1088, wherein said purine analogs comprise adenosine analogs, deoxyadenosine analogs, guanosine analogs, deoxyguanosine analogs or a combination of any of the foregoing.

1119. (NEW) The oligo- or polydeoxyribonucleotide of claim 1118, wherein said adenosine analogs comprise tubericidin and toyocamycin.

1120. (NEW) The oligo- or polydeoxyribonucleotide of claim 1088, further comprising at least one ribonucleotide.

1121. (NEW) An oligo- or polydeoxyribonucleotide which is complementary to a nucleic acid of interest or a portion thereof, said oligo- or polydeoxyribonucleotide comprising at least one modified nucleotide or modified analog having the structural formula:



wherein BASE is a moiety comprising a pyrimidine, a pyrimidine analog, a purine, a purine analog, a deazapurine or a deazapurine analog, wherein said analog can be attached to or coupled to or incorporated into DNA or RNA, wherein said analog does not substantially interfere with double helix formation or nucleic acid hybridization, and wherein said BASE is attached to the 1' position of the furanosyl ring from the N1 position when said BASE is a pyrimidine or a pyrimidine analog, or

from the N9 position of the furanosyl ring when said BASE is a purine, a purine analog, a deazapurine or a deazapurine analog;

wherein x comprises H—, HO—, a mono-phosphate, a di-phosphate or a tri-phosphate;

wherein y comprises H—, HO—, a mono-phosphate, a di-phosphate or a tri-phosphate;

wherein z comprises H—, HO—, a mono-phosphate, a di-phosphate or a tri-phosphate; and

wherein Sig is covalently attached through a chemical linkage to at least one phosphate comprising x, y, z, or a combination thereof, wherein said chemical linkage comprises a polypeptide, and wherein said Sig comprises a non-polypeptide, non-nucleotidyl non-radioactive label moiety which can be directly or indirectly detected when attached to said phosphate via said polypeptide chemical linkage, or when said modified nucleotide is incorporated into said oligo- or polydeoxynucleotide, or when said oligo- or polydeoxynucleotide is hybridized to said complementary nucleic acid of interest or a portion thereof.

1122. (NEW) The oligo- or polydeoxyribonucleotide of claim 1121, wherein Sig comprises at least three carbon atoms.

1123. (NEW) The oligo- or polydeoxyribonucleotide of claim 1121, wherein Sig comprises biotin, iminobiotin, an electron dense component, a magnetic component, a metal-containing component, a fluorescent component, a chemiluminescent component, a chromogenic component, a saccharide component or a combination of any of the foregoing.



1124. (NEW) The oligo- or polydeoxyribonucleotide of claim 1123, wherein said magnetic component comprises magnetic oxide.

1125. (NEW) The oligo- or polydeoxyribonucleotide of claim 1124, wherein said magnetic oxide comprises ferric oxide.

1126. (NEW) The oligo- or polydeoxyribonucleotide of claim 1123, wherein said metal-containing component is catalytic.

1127. (NEW) The oligo- or polydeoxyribonucleotide of claim 1123, wherein said fluorescent component comprises fluorescein, rhodamine or dansyl.

1128. (NEW) The oligo- or polydeoxyribonucleotide of claim 1123, wherein said saccharide component comprises a polysaccharide, an oligosaccharide or a monosaccharide.

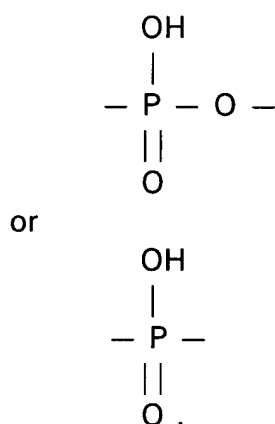
1129. (NEW) The oligo- or polydeoxynucleotide of claim 1123, wherein said saccharide component comprises a monosaccharide.

1130. (NEW) The oligo- or polydeoxyribonucleotide of claim 1121, wherein said polypeptide chemical linkage comprises polylysine.

1131. (NEW) The oligo- or polydeoxyribonucleotide of claim 1121, wherein said polypeptide chemical linkage comprises avidin, streptavidin or anti-hapten immunoglobulin.

1132. (NEW) The oligo- or polydeoxyribonucleotide of claim 1121, wherein said Sig moiety is attached via said polypeptide chemical linkage to a phosphate moiety in a terminal nucleotide in said oligo- or polydeoxyribonucleotide.

1133. (NEW) The oligo- or polydeoxyribonucleotide of claim 1121, wherein said covalent attachment comprises

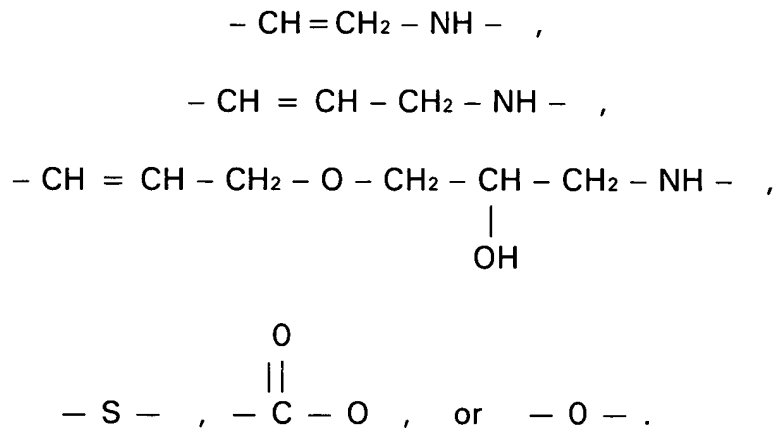


1134. (NEW) The oligo- or polydeoxyribonucleotide of claim 1121, wherein said polypeptide chemical linkage does not interfere substantially with the characteristic ability of Sig to form a detectable signal.

1135. (NEW) The oligo- or polydeoxyribonucleotide of claim 1121, wherein said polypeptide chemical linkage comprises a -CH<sub>2</sub>NH- moiety.

1136. (NEW) The oligo- or polydeoxyribonucleotide of claim 1121, wherein said polypeptide chemical linkage comprises an allylamine group.

1137. (NEW) The oligo- or polydeoxyribonucleotide of claim 1121, wherein said polypeptide chemical linkage further comprises any of the moieties:



1138. (NEW) The oligo- or polydeoxyribonucleotide of claim 1121, wherein said polypeptide chemical linkage comprises a glycosidic linkage moiety.

1139. (NEW) The oligo- or polydeoxyribonucleotide of claim 1121, wherein said x comprises a monophosphate, a diphosphate or a triphosphate and y comprises a monophosphate.

1140. (NEW) The oligo- or polydeoxyribonucleotide of claim 1121, wherein said Sig moiety is covalently indirectly attached to said phosphate through a phosphorus atom or phosphate oxygen.

1141. (NEW) The oligo- or polydeoxyribonucleotide of claim 1121, wherein said x comprises a monophosphate.

1142. (NEW) The oligo- or polydeoxyribonucleotide of claim 1121, wherein said Sig moiety is attached via said polypeptide chemical linkage to the furanosyl moiety of a terminal nucleotide in said oligo- or polydeoxyribonucleotide.

1143. (NEW) The oligo- or polydeoxyribonucleotide of claim 1142, wherein z of said furanosyl moiety of said terminal nucleotide comprises a hydrogen atom.

1144. (NEW) The oligo- or polydeoxyribonucleotide of claim 1142, wherein z of said furanosyl moiety of said terminal nucleotide comprises an oxygen atom.

1145. (NEW) The oligo- or polydeoxyribonucleotide of claim 1143, wherein y of said furanosyl moiety comprises a hydrogen atom.

1146. (NEW) The oligo- or polydeoxyribonucleotide of claim 1144, wherein y of said furanosyl moiety comprises an oxygen atom.

1147. (NEW) The oligo- or polydeoxyribonucleotide of claim 1129, wherein said monosaccharide is attached to a terminal nucleotide in said oligo- or polydeoxyribonucleotide.

1148. (NEW) The oligo- or polydeoxyribonucleotide of claim 1121, wherein said furanosyl moiety comprises a ribose, a deoxyribose or a dideoxyribose.

1149. (NEW) The oligo- or polydeoxyribonucleotide of claim 1121, wherein said pyrimidine analogs comprise thymidine analogs, uridine analogs, deoxyuridine analogs, cytidine analogs, deoxycytidine analogs or a combination of any of the foregoing.

1150. (NEW) The oligo- or polydeoxyribonucleotide of claim 1149, wherein said uridine analogs comprise 5-bromo-2'-deoxyuridine-5'-phosphate.

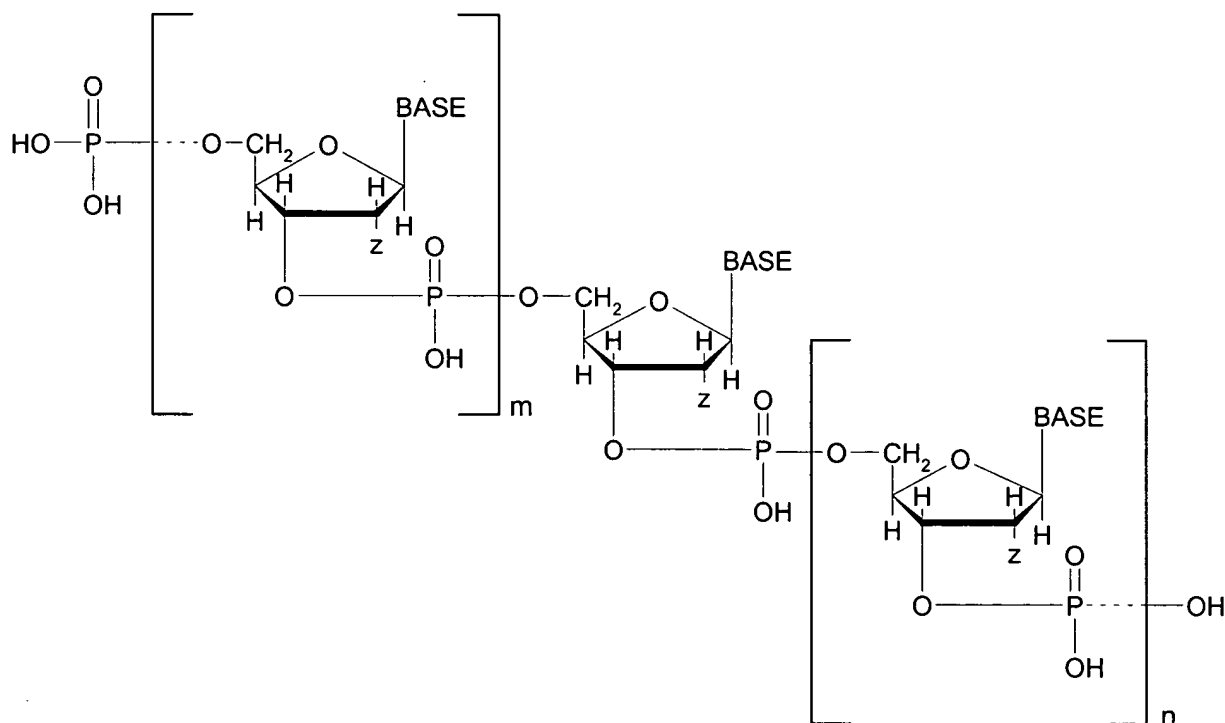
1151. (NEW) The oligo- or polydeoxyribonucleotide of claim 1149, wherein said deoxycytidine analogs comprise 5-hydroxymethyl-2'-deoxycytidylic acid.

1152. (NEW) The oligo- or polydeoxyribonucleotide of claim 1121, wherein said purine analogs comprise adenosine analogs, deoxyadenosine analogs, guanosine analogs, deoxyguanosine analogs, or a combination of any of the foregoing.

1153. (NEW) The oligo- or polydeoxyribonucleotide of claim 1152, wherein said adenosine analogs comprise tubericidin or toyocamycin.

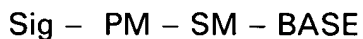
1154. (NEW) The oligo- or polydeoxyribonucleotide of claim 1121, further comprising at least one ribonucleotide.

1155. (NEW) The oligo- or polydexoxyribonucleotide of claim 1121, having the structural formula:



wherein m and n represent integers from 0 up to about 100,000, and wherein said Sig moiety is attached to at least one of the phosphate moieties in said structural formula.

1156. (NEW) An oligo- or polynucleotide which is complementary to a nucleic acid of interest or a portion thereof, said oligo- or polynucleotide comprising at least one modified nucleotide or modified nucleotide analog having the formula



wherein PM is a phosphate moiety, SM is a furanosyl moiety and BASE is a base moiety comprising a pyrimidine, a pyrimidine analog, a purine, a purine analog, a deazapurine or a deazapurine analog, wherein said analog can be attached to or coupled to or incorporated into DNA or RNA, wherein said analog does not

substantially interfere with double helix formation or nucleic acid hybridization, wherein said PM is attached to SM, said BASE is attached to SM, said Sig is covalently attached to PM via a chemical linkage comprising a polypeptide, and wherein Sig comprises a non-polypeptide, non-nucleotidyl, non-radioactive label moiety which can be directly or indirectly detected when attached to PM via said polypeptide chemical linkage or when said modified nucleotide is incorporated into said oligo- or polynucleotide, or when said oligo- or polynucleotide is hybridized to said complementary nucleic acid of interest or a portion thereof, provided that when said oligo- or polynucleotide is an oligoribonucleotide or a polyribonucleotide, and when Sig is attached through a chemical linkage to a terminal PM at the 3' position of a terminal ribonucleotide, said chemical linkage is not obtained through a 2',3' vicinal oxidation of a 3' terminal ribonucleotide previously attached to said oligoribonucleotide or polyribonucleotide.

1157. (NEW) The oligo- or polynucleotide of claim 1156, wherein Sig comprises at least three carbon atoms.

1158. (NEW) The oligo- or polynucleotide of claim 1156, wherein Sig comprises biotin, iminobiotin, an electron dense component, a magnetic component, a metal-containing component, a fluorescent component, a chemiluminescent component, a chromogenic component, a saccharide component or a combination of any of the foregoing.

1159. (NEW) The oligo- or polynucleotide of claim 1158, wherein said magnetic component comprises magnetic oxide.

1160. (NEW) The oligo- or polynucleotide of claim 1159, wherein said magnetic oxide comprises ferric oxide.

1161. (NEW) The oligo- or polynucleotide of claim 1158, wherein said metal-containing component is catalytic.

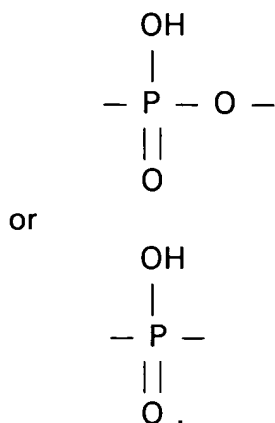
1162. (NEW) The oligo- or polynucleotide of claim 1158, wherein said fluorescent component comprises fluorescein, rhodamine or dansyl.

1163. (NEW) The oligo- or polynucleotide of claim 1158, wherein said saccharide component comprises a polysaccharide, an oligosaccharide or a monosaccharide.

1164. (NEW) The oligo- or polynucleotide of claim 1163, wherein said saccharide component comprises a monosaccharide.



1165. (NEW) The oligo- or polynucleotide of claim 1156, wherein said covalent attachment comprises:

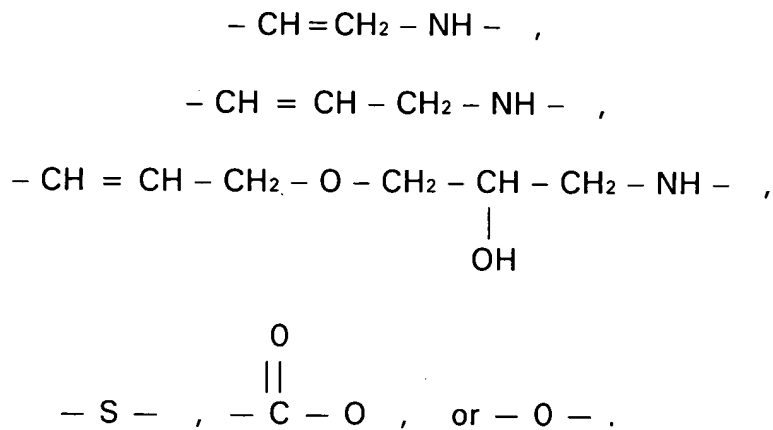


1166. (NEW) The oligo- or polynucleotide of claim 1156, wherein said polypeptide chemical linkage does not interfere substantially with the characteristic ability of Sig to form a detectable signal.

1167. (NEW) The oligo- or polynucleotide of claim 1156, wherein said polypeptide chemical linkage comprises a -CH<sub>2</sub>NH- moiety.

1168. (NEW) The oligo- or polynucleotide of claim 1156, wherein said polypeptide chemical linkage comprises an allylamine group.

1169. (NEW) The oligo- or polynucleotide of claim 1156, wherein said polypeptide chemical linkage further comprises any of the moieties:



1170. (NEW) The oligo- or polynucleotide of claim 1156, wherein said polypeptide chemical linkage further comprises a glycosidic linkage moiety.

1171. (NEW) The oligo- or polynucleotide of claim 1156, wherein said PM comprises a monophosphate, a diphosphate or a triphosphate.

1172. (NEW) The oligo- or polynucleotide of claim 1156, wherein said Sig moiety is covalently attached to said PM through a phosphorus atom or phosphate oxygen.

1173. (NEW) The oligo- or polynucleotide of claim 1156, wherein said Sig moiety is attached via said polypeptide chemical linkage to the furanosyl moiety of a terminal nucleotide in said oligo- or polynucleotide.

1174. (NEW) The oligo- or polynucleotide of claim 1173, wherein the furanosyl moiety of said terminal nucleotide comprises a hydrogen atom at the 2' position thereof.

1175. (NEW) The oligo- or polynucleotide of claim 1173, wherein the furanosyl moiety of said terminal nucleotide comprises an oxygen atom at the 2' position thereof.

1176. (NEW) The oligo- or polynucleotide of claim 1174, wherein the furanosyl moiety of said terminal nucleotide comprises a hydrogen atom at the 3' position thereof.

1177. (NEW) The oligo- or polynucleotide of claim 1175, wherein the furanosyl moiety of said terminal nucleotide comprises an oxygen atom at the 3' position thereof.

1178. (NEW) The oligo- or polynucleotide of claim 1164, wherein said monosaccharide is attached to a terminal nucleotide in said oligo- or polynucleotide.

1179. (NEW) The oligo- or polynucleotide of claim 1156, wherein said furanosyl moiety comprises a ribose, a deoxyribose or a dideoxyribose.

1180. (NEW) The oligo- or polynucleotide of claim 1156, wherein said pyrimidine analogs comprise thymidine analogs, uridine analogs, deoxyuridine analogs, cytidine analogs, deoxycytidine analogs or a combination of any of the foregoing.

1181. (NEW) The oligo- or polynucleotide of claim 1180, wherein said uridine analogs comprise 5-bromo-2'-deoxyuridine-5'-phosphate.

1182. (NEW) The oligo- or polynucleotide of claim 1180, wherein said deoxycytidine analogs comprise 5-hydroxymethyl-2'-deoxycytidylic acid.

1183. (NEW) The oligo- or polynucleotide of claim 1156, wherein said purine analogs comprise adenosine analogs, deoxyadenosine analogs, guanosine analogs, deoxyguanosine analogs or a combination of any of the foregoing.

1184. (NEW) The oligo- or polynucleotide of claim 1183, wherein said adenosine analogs comprise tubercidin and toyocamycin.

1185. (NEW) The oligo- or polynucleotide of claim 1156, wherein said oligo- or polynucleotide comprises an oligo- or polydeoxyribonucleotide.

1186. (NEW) The oligo- or polynucleotide of claim 1185, wherein said oligo- or polydeoxyribonucleotide further comprises at least one ribonucleotide.

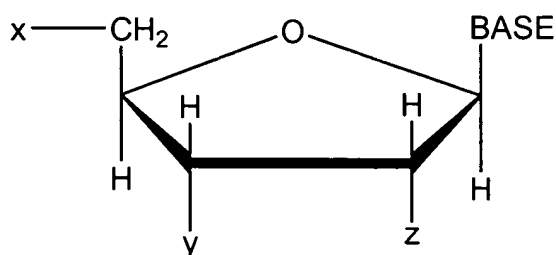
1187. (NEW) The oligo- or polynucleotide of claim 1156, wherein said oligo- or polynucleotide comprises an oligo- or polyribonucleotide.

1188. (NEW) The oligo- or polynucleotide of claim 1187, wherein said oligo- or polyribonucleotide further comprises at least one deoxyribnucleotide.

1189. (NEW) The oligo- or polynucleotide of claim 1156, wherein said polypeptide chemical linkage comprises polylysine.

1190. (NEW) The oligo- or polynucleotide of claim 1156, wherein said polypeptide chemical linkage comprises avidin, streptavidin or anti-hapten immunoglobulin.

1191. (NEW) An oligo- or polynucleotide which is complementary to a nucleic acid of interest or a portion thereof, said oligo- or polynucleotide comprising at least one modified nucleotide or modified nucleotide having the structural formula:



wherein BASE is a base moiety comprising a pyrimidine, a pyrimidine analog, a purine, a purine analog, a deazapurine or a deazapurine analog, wherein said analog can be attached to or coupled to or incorporated into DNA or RNA wherein said analog does not substantially interfere with double helix formation or nucleic acid hybridization, and wherein said BASE is attached to the 1' position of the furanosyl ring from the N1 position when said BASE is a pyrimidine or a pyrimidine analog, or from the N9 position when said BASE is a purine, a purine analog, a deazapurine or a deazapurine analog;

wherein x comprises  $\text{H}-$ ,  $\text{HO}-$ , a mono-phosphate, a di-phosphate or a tri-phosphate;

wherein y comprise  $\text{H}-$ ,  $\text{HO}-$ , a mono-phosphate, a di-phosphate or a tri-phosphate;

wherein z comprises  $\text{H}-$ ,  $\text{HO}-$ , a mono-phosphate, a di-phosphate or a tri-phosphate; and

wherein Sig is covalently attached through a chemical linkage to at least one phosphate comprising x, y, z, or a combination thereof, said chemical linkage comprising a polypeptide, and wherein said Sig comprises a non-polypeptide, non-nucleotidyl, non-radioactive label moiety which can be directly detected when attached to said phosphate via said polypeptide chemical linkage or when said

modified nucleotide is incorporated into said oligo- or polynucleotide, or when said oligo- or polynucleotide is hybridized to said complementary nucleic acid of interest or a portion thereof, provided that when said oligo- or polynucleotide is an oligoribonucleotide or a polyribonucleotide and when Sig is attached through a chemical linkage to a terminal PM at the 3' position of a terminal ribonucleotide, said chemical linkage is not obtained through a 2',3' vicinal oxidation of a 3' terminal ribonucleotide previously attached to said oligoribonucleotide or polyribonucleotide.

1192. (NEW) The oligo- or polynucleotide of claim 1191, wherein Sig comprises at least three carbon atoms.

1193. (NEW) The oligo- or polynucleotide of claim 1191, wherein Sig comprises biotin, iminobiotin, an electron dense component, a magnetic component, a metal-containing component, a fluorescent component, a chemiluminescent component, a chromogenic component, a saccharide component or a combination of any of the foregoing.

1194. (NEW) The oligo- or polynucleotide of claim 1193, wherein said magnetic component comprises magnetic oxide.

1195. (NEW) The oligo- or polynucleotide of claim 1194, wherein said magnetic oxide comprises ferric oxide.

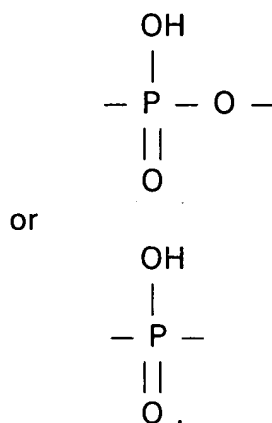
1196. (NEW) The oligo- or polynucleotide of claim 1193, wherein said metal-containing component is catalytic.

1197. (NEW) The oligo- or polynucleotide of claim 1193, wherein said fluorescent component comprises fluorescein, rhodamine or dansyl.

1198. (NEW) The oligo- or polynucleotide of claim 1193, wherein said saccharide component comprises a polysaccharide, an oligosaccharide or a monosaccharide.

1199. (NEW) The oligo- or polynucleotide of claim 1198, wherein said saccharide component comprises a monosaccharide.

1200. (NEW) The oligo- or polynucleotide of claim 1191, wherein said covalent attachment comprises

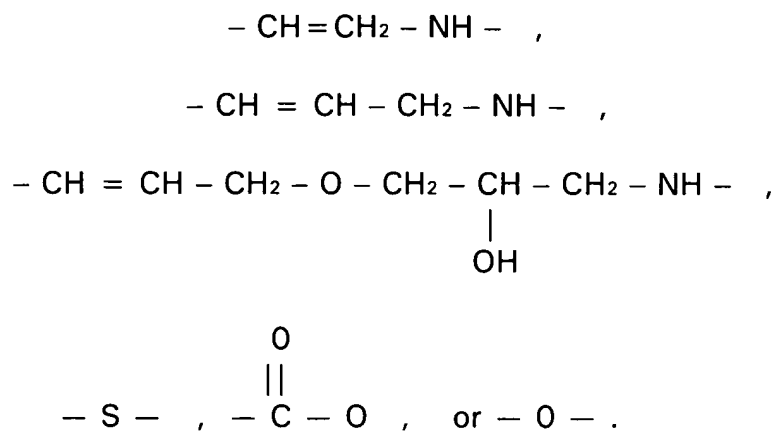


1201. (NEW) The oligo- or polynucleotide of claim 1191, wherein said polypeptide chemical linkage does not interfere substantially with the characteristic ability of Sig to form a detectable signal.

1202. (NEW) The oligo- or polynucleotide of claim 1191, wherein said polypeptide chemical linkage comprises a -CH<sub>2</sub>NH- moiety.

1203. (NEW) The oligo- or polynucleotide of claim 1191, wherein said polypeptide chemical linkage comprises an allylamine group.

1204. (NEW) The oligo- or polynucleotide of claim 1191, wherein said polypeptide chemical linkage comprises any of the moieties:



1205. (NEW) The oligo- or polynucleotide of claim 1191, wherein said polypeptide chemical linkage comprises a glycosidic linkage moiety.

1206. (NEW) The oligo- or polynucleotide of claim 1191, wherein said x comprises a monophosphate, a diphosphate or a triphosphate and y comprises a monophosphate.

1207. (NEW) The oligo- or polynucleotide of claim 1191, wherein said Sig moiety is covalently attached to said phosphate through a phosphorus atom or phosphate oxygen.

1208. (NEW) The oligo- or polynucleotide of claim 1191, wherein said x comprises a monophosphate.



1209. (NEW) The oligo- or polynucleotide of claim 1191, wherein said Sig moiety is attached via said polypeptide chemical linkage to the furanosyl moiety of a terminal nucleotide in said oligo- or polynucleotide.

1210. (NEW) The oligo- or polynucleotide of claim 1209, wherein z of said furanosyl moiety of said terminal nucleotide comprises a hydrogen atom.

1211. (NEW) The oligo- or polynucleotide of claim 1209, wherein z of said furanosyl moiety of said terminal nucleotide comprises an oxygen atom.

1212. (NEW) The oligo- or polynucleotide of claim 1210, wherein y of said furanosyl moiety comprises a hydrogen atom.

1213. (NEW) The oligo- or polynucleotide of claim 1211, wherein y of said furanosyl moiety comprises an oxygen atom.

1214. (NEW) The oligo- or polynucleotide of claim 1199, wherein said monosaccharide is attached to a terminal nucleotide in said oligo- or polynucleotide.

1215. (NEW) The oligo- or polynucleotide of claim 1191, wherein said furanosyl moiety comprises a ribose, a deoxyribose or a dideoxyribose.

1216. (NEW) The oligo- or polynucleotide of claim 1191, wherein said pyrimidine analogs comprise thymidine analogs, uridine analogs, deoxyuridine analogs, cytidine analogs, deoxycytidine analogs or a combination of any of the foregoing.

1217. (NEW) The oligo- or polynucleotide of claim 1216, wherein said uridine analogs comprise 5-bromo-2'-deoxyuridine-5'-phosphate.

1218. (NEW) The oligo- or polynucleotide of claim 1216, wherein said deoxycytidine analogs comprise 5-hydroxymethyl-2'-deoxycytidylic acid.

1219. (NEW) The oligo- or polynucleotide of claim 1191, wherein said purine analogs comprise adenosine analogs, deoxyadenosine analogs, guanosine analogs, deoxyguanosine analogs, or a combination of any of the foregoing.

1220. (NEW) The oligo- or polynucleotide of claim 1219, wherein said adenosine analogs comprise tubercidin and toyocamycin.

1221. (NEW) The oligo- or polynucleotide of claim 1191, further comprising at least one ribonucleotide.

1222. (NEW) The oligo- or polynucleotide of claim 1191, wherein said oligo- or polynucleotide comprises an oligo- or polydeoxyribonucleotide.

1223. (NEW) The oligo- or polynucleotide of claim 1222, wherein said oligo- or polydeoxyribonucleotide further comprises at least one ribonucleotide.

1224. (NEW) The oligo- or polynucleotide of claim 1191, wherein said oligo- or polynucleotide comprises an oligo- or polyribonucleotide.

1225. (NEW) The oligo- or polynucleotide of claim 1224, wherein said oligo- or polyribonucleotide further comprises at least one deoxyribnucleotide.

1226. (NEW) The oligo- or polynucleotide of claim 1191, wherein said polypeptide chemical linkage comprises polylysine.

1227. (NEW) The oligo- or polynucleotide of claim 1191, wherein said polypeptide chemical linkage comprises avidin, streptavidin or anti-hapten immunoglobulin.

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